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REVIEWS OF NEW BOOKS.

THE BEGINNING OF THE SLAVE TRADE.

The Conquerors of the New World and their Bondsmen, &c. Vol. I. Pickering.

A NARRATIVE of the principal events which led to Negro slavery in the West Indies and America must (if commonly well done) be an interesting history. And here it is not only not commonly, but uncommonly, well done, replete with talent, happy in style, and brilliantly sensible in commentary. The author seems to fear that his subject would be found dry: we can assure him, at least for our own parts, that we have found it quite the reverse. He thus, in his dedication to Dr. Phelps, the master of Sydney Sussex College, Cambridge, states his object:

"Wishing to submit to the 'Friends in Council,' whom you know of, certain essays on the subject of slavery, I had occasion to refer to some of the general works of history, which treat, incidentally, of this matter. The more I read, the less satisfied I felt with the result of that reading, and the greater wish I experienced to make out something like the full and true story for myself."

"To do that, it was necessary to refer to certain Spanish records which remain unpublished: these I was not only permitted to examine and to copy from, but also assisted in doing so, with a kindness and a frankness for which I feel grateful to the Historical Academy at Madrid, and its officers."

"I may mention that no one could have made much of these papers, unless with very long study, if the task of collecting and arranging them had not been undertaken by one so competent to it as the historian Munoz, whose accuracy and research deserve the highest praise, and whose early death was a loss to European literature."

"With regard to the general aim of the work, I can best explain that to you by showing the want which this narrative is intended to supply."

"In considering the present condition of the West Indies or the southern States of America, it may occur even to a comparatively unobservant person, that these countries are largely peopled by a race not native to the soil: he hears of another race which in some parts has entirely passed away; and he sees a third which is and was dominant over both. He naturally wishes to know the account of these things, thinking rightly, that study of the past furnishes the steadiest lights for deciphering the present; or, as the Spaniards have it, '*De la relación verdadera del hecho, nace y tiene origen el derecho;*' which, being somewhat liberally rendered, runs thus—The true version of the story gives the right view of the case."

"What I aim at, then, in this narration, is to show such an enquirer how the black people came to the New World, how the brown people faded away from certain countries in it; and what part the white had in these doings."

"This is not an easy undertaking. You, as an artist, know how difficult it is from scattered objects, picturesque and interesting enough, perhaps, in themselves, but not so connected together as readily to fall into any harmonious grouping, to select those which shall fully represent the locality meant to be depicted, and yet not form an unpleasing picture. You will, therefore, be indulgent to my attempt at a similar piece of composition."

"I have taken a larger scope than was absolutely needful, in beginning with the Portuguese discoveries

in Africa, which I might have supposed to be known to my readers. But I have little scruple in doing this, as I generally find I gain most from those books which presume the reader to be most ignorant. Before studying this subject of slavery, I had no knowledge of what may be supposed to be the well-known facts of the case; and as I traced up the matter to its source for my own information, so my narrative is simply formed by retracing my steps.

"I have said enough in explanation of the book, and have now only to commend it to your friendly perusal."

A brief poem brings us to the history of the Portuguese persevering nautical expeditions throughout the fifteenth century, especially of those as the head mover of which stood the famous Prince Henry. These ended in the introduction of slavery, of which the author tersely observes:

"Black against us, and almost unaccountably mean and cruel as much of this history is, still it is not altogether without something to be said for us on the other side; and is by no means destitute of the highest matters of human interest. The history of slavery is not merely an account of commercial greediness and reckless cruelty carried to the uttermost; but embodies the efforts of the greatest men of many periods, their errors, their disputations, their bewilderments: it partakes largely of the nice questions canvassed by ecclesiastics; is combined with the intrigues of courts and cabinets; and, alas! is borne on the winds by the resolute daring of hardy mariners and far-seeing discoverers—men who should have been foremost in the attack upon all mean cruelty, and some of whom thought that they were. Again, in the history of slavery, if it could be well worked out, lie the means of considering questions of the first import touching colonization, agriculture, social order, and government."

The Canary Isles occupy the first place on the roll of discovery and colonization. In 1418, the earliest explorers sailed in two vessels by orders of Prince Henry; and we read:

"One night in that year he is thought to have had a dream of promise, for, on the ensuing morning, he suddenly ordered two vessels to be got ready forthwith; and placed them under the command of Joham Gonçalvez Zarco and Tristam Vaz, gentlemen of his household, to proceed down the Barbary coast on a voyage of discovery."

"The contemporary chronicler, Azurara, tells the story more simply, and merely gives us to understand that these young men, after the ending of the Ceuta campaign, were as eager for employment as the prince for discovery; and that they were ordered on a voyage having for its object the general molestation of the Moors as well as that of making discoveries beyond Cape Nam. The Portuguese mariners had a proverb about this Cape, 'he who would pass Cape Not, either will return, or not,' (*Quem passaro Cabo de Nam, ou tornará, ou nam.*) intimating that if he did not turn before passing the Cape, he would never return at all. On the present occasion it was not destined to be passed; for these captains, Joham Gonçalvez Zarco and Tristam Vaz, were driven out of their course by storms, and accidentally discovered a little island, where they took refuge, and from that circumstance called the island Porto Santo. 'They found there,' says Sousa, 'a race of people in no respect arranged politically, but not altogether barbarous and savage, and possessing a kindly and most fertile soil.' I mention this description of the first land discovered by Prince Henry's captains, thinking it would well apply to many other lands about to be found out by his captains and other discoverers,

Joham Gonçalvez and Tristam Vaz return. Their master is delighted with the news they bring him, more on account of its promise than its substance. In the same year he sends them out again together with a third captain, Bartholomew Perestrelo, and assigns a ship to each captain. His object is not only to discover more islands, but to improve his Porto Santo. He sends, therefore, various seeds and animals. This seems a man worthy to direct discovery. Unfortunately, however, amongst the animals, some rabbits are introduced into the new island; and they conquer it, not for the prince, but for themselves. Hereafter, we shall find them giving his people much trouble, and causing some reproach to him."

Next year Madeira was discovered by the same parties; and Perestrelo, the "father-in-law of Columbus, who, indeed, lived at Porto Santo for some time, and here, on new-found land, meditated far bolder discoveries," as the captain of that small island, "after a strenuous contest with the rabbits, having killed an army of them, died himself."

The narrative goes on:

"While these things were occurring at Madeira and at Porto Santo, Prince Henry had been prosecuting his general scheme of discovery, sending out two or three vessels each year, with orders to go down the coast from Cape Nam, and make what discoveries they could, but these did not amount to much, for the captains never got beyond Cape Bojador, which is situated seventy leagues to the south of Cape Nam. This Cape Bojador was formidable in itself, being terminated by a ridge of rocks with fierce currents running round them: but was much more formidable from the fancies which the mariners had formed of the sea and land beyond it; for men, though they may shrink from an undertaking, yet will not be without their theories about it to justify their fears. 'It is clear,' they said, 'that beyond this cape there is no people whatever; the land is as bare as Libya, no water, no trees, no grass in it; the sea so shallow that at a league from the land it is only a fathom deep; the currents so fierce, that the ship which passes that cape will never return.'

"This outstretcher (for such is the meaning of the word Bojador) was therefore as a bar drawn across the anxious hopes of our great discoverer.

"We hear that he had now been working at his discoveries for twelve years with little approbation from many persons, (*con poca aprobación de muchos*), the discovery of these islands, Porto Santo and Madeira, serving to whet his appetite for further enterprise, but not winning the common voice in favour of prosecuting discoveries on the coast of Africa. The people at home, improving upon the reports of the sailors, said that 'the land which the Prince sought after was merely some sandy place like the deserts of Libya; that Princes had possessed the empire of the world and yet had not undertaken such designs as his, or shown such anxiety to find new kingdoms: that the men who arrived in those foreign parts (if they did arrive) turned from white into black men: that the king Don John, the Prince's father, had given to strangers lands in his kingdom, to break them up and cultivate them, a thing very different from taking the people out of Portugal, which had need of them, to bring them among savages to be eaten, and to place them upon lands of which the mother-country had no need; that the Author of the world had provided these islands solely for the habitation of wild beasts, of which an additional proof was, that the very rabbits they themselves had introduced were now dispossessing them of the island.'

* The title assumed by a knot of literary men, whose small but important publications we have had frequent occasion to notice with high eulogy, and to some volumes of which we still owe equal notice and no less praise.—ED. L. G.

"There is much here of the usual captiousness to be found in bystanders' criticisms upon action, mixed with a great deal of *false assertion* and premature knowledge of the ways of Providence. Still it were to be wished that most criticism upon action was as wise. For that part of the common talk which spoke of King John's doings, and of the keeping their own population to bring out their own resources, had a wisdom in it which the men of future centuries were yet to discover throughout the Peninsula.

"Prince Henry, as we may see by his perseverance up to this time, was not a man to have his purposes diverted by such criticism, much of which must have been in his eyes worthless and inconsequent in the extreme. Nevertheless, he had his own misgivings. It must have been a weary time of late years to him. His captains returned one after another with no good tidings of discovery, but with petty plunder gained as they returned, from incursions on the Moorish coast. The prince concealed from them his chagrin at the fruitless nature of their attempts; but probably did not feel it less on that account. He began to think, was it for him to hope to discover that land which had been hidden from so many princes? Still he felt within himself the incitement of a 'virtuous obstinacy' which would not let him rest. Would it not, he thought, be ingratitude to God who thus moved his mind to these attempts, if he were to desist from his work, or be negligent in it? He resolved, therefore, to send out Gil Eannes, one of his household, who had been sent out the year before, but had returned, like the rest, having discovered nothing. He had been driven to the Canary Islands, and had seized upon some of the natives there whom he brought back. With this transaction the prince had shown himself dissatisfied, and Gil Eannes, now entrusted again with command, resolved to meet all dangers to carry out the wishes of his master. Before his departure, the prince called him aside and said, 'You cannot meet with such peril that the hope of your reward shall not be much greater; and in truth, I wonder what imagination this is that you have all taken up,—in a matter, too, of so little certainty; for if these things which are reported had any authority, however little, I would not blame you so much. But you quote to me the opinions of four mariners, who, as they were driven out of their way to Franades, or to some other ports to which they commonly navigated, had not, and could not have used, the needle and the chart; but do you go, however, and make your voyage without regard to their opinion, and, by the grace of God, you will not bring out of it anything but honour and profit.'

"We may well imagine that these stirring words of the Prince must have confirmed Gil Eannes in his resolve to wipe out the stain of his former misadventure. And he succeeded in doing so; for he passed the dreaded Cape Bojador,—a great event in the history of African discovery, and one that in that day was considered equal to a labour of Hercules. Gil Eannes returned to a grateful and most delighted master. He tells the prince that he had landed, and that the soil appeared to him unworked and fruitful; and, like a prudent man, could not only tell of foreign plants, but had brought some home with him in a barrel of the new-found earth, plants much like those which bear in Portugal the roses of Santa Maria. The prince rejoiced to see them, and gave thanks to God, 'as if they had been the fruit and sign of the promised land; and besought our lady, whose name the plants bore, that she would guide and set forth the doings in this discovery to the praise and glory of God, and to the increase of his sacred faith.'

"The pious wish expressed above is the first of the kind that we have occasion to notice in this historical account; but similar wishes seem to have been predominant in the minds of the greatest discoverers and promoters of discovery in those times. I believe this desire of theirs to have been thoroughly genuine and deep-seated; and, in fact, that the discoveries would not have been made at that period but for the impulse given to them by the most pious minds longing to promote, by all means in their power, the spread of what to them was the only true

and saving faith. We shall find much to blame in the conduct of the first discoverers in Africa and America, but we must do them the justice to acknowledge that the love of gold was not by any means the only motive which urged them, or which could have urged them, to such endeavours as theirs. We should more readily admit the above conclusion, if we kept in our minds the views then universally entertained of the merits and efficacy of mere formal communion with the church, and the fatal consequences of not being within that communion. A man so enlightened as Las Casas, scorns passages brought against him in argument from the works of heathen writers, men who are now living in hell, as he says: and Columbus, in giving an account of his third voyage to the Catholic sovereigns, says, that in temporal matters he has only a 'blanca' for the offertory, and that in spiritual matters he is so apart from the holy sacraments of the holy church, that if he were to die where he is, his soul would be forgotten (*que se olvidaría de la anima si se aparta acá del cuerpo*). 'Weep for me,' he says, 'ye that are charitable, true, or just.' "And doubtless in the minds of the common people, the advantage of this communion with the church stood at the highest. This will go a long way to explain the wonderful inconsistency, as it seems to us, of the most cruel men appealing to their good works as promoters of the faith. And the maintenance of such church principles will altogether account for the strange oversights which pure and high minds have made in the means of carrying out those principles, fascinated as they were by the brilliancy and magnitude of the main object they had in view."

This long extract is a fair example of the work. In 1444 the first slaves were brought into Portugal, and for a time Moors and Negroes (the latter after 1445, when the first four were imported) were indiscriminately captured, and brought away from their native lands. Their sufferings are painted with painful truth, and the chronicler tells:

"The other day, which was the eighth of August, very early in the morning, by reason of the heat, the mariners began to bring to their vessels, and, as they had been commanded, to draw forth those captives to take them out of the vessel: whom, placed together on that plain, it was a marvellous sight to behold, for amongst them, there were some of a reasonable degree of whiteness, handsome, and well-made; others less white, resembling leopards in their colour; others as black as Ethiopians, and so ill-formed, as well in their faces as their bodies, that it seemed to the beholders as if they saw the forms of a lower hemisphere. But what heart was that, how hard soever, which was not pierced with sorrow seeing that company: for some had sunken cheeks, and their faces bathed in tears, looking at each other; others were groaning very dolorously, looking at the heights of the heavens, fixing their eyes upon them, crying out loudly, as if they were asking succour from the Father of nature; others struck their faces with their hands, throwing themselves on the earth; others made their lamentations in songs, according to the customs of their country, which, although we could not understand their language, we saw corresponded well to the height of their sorrow. But now, for the increase of their grief, came those who had the charge of the distribution, and they began to put them apart one from the other, in order to equalize the portions; wherefore it was necessary to part children and parents, husbands and wives, and brethren from each other. Neither in the partition of friends and relations was any law kept, only each fell where the lot took him. O powerful fortune! who goest hither and thither with thy wheels, compassing the things of the world as it pleaseth thee, if thou canst, place before the eyes of this miserable nation some knowledge of the things that are to come after them (*cousas postumeiras*) that they may receive some consolation in the midst of their great sadness! and you others who have the business of this partition, look with pity on such great misery, and consider how can those be parted whom you cannot disunite! Who will be able to make this partition without great diffi-

culty? for while they were placing in one part the children that saw their parents in another, they sprang up perseveringly and fled to them; the mothers enclosed their children in their arms and threw themselves with them on the ground, receiving wounds with little pity for their own flesh so that their children might not be torn from them! And so, with labour and difficulty, they concluded the partition, for, besides the trouble they had with the captives, the plain was full of people, as well of the places as of the villages and neighbourhood around, who in that day gave rest to their hands, the mainstay of their livelihood, only to see this novelty. And as they looked upon these things, some deplored, some reasoning upon them, they made such a riotous noise, as greatly to disturb those who had the management of this distribution. The Infante was there upon a powerful horse, accompanied by his people, looking out his share, but as a man who for his part did not care for gain, for of the forty-six souls which fell to his fifth, he speedily made his choice, as all his principal riches were in his contentment, considering with great delight the salvation of those souls which before were lost."

Upon this the author remarks:

"The good Azurara wishes that these captives might have some foresight of the things to happen after their death: I do not think it would have proved much consolation to them to have foreseen that they were almost the first of many millions to be dealt with as they had been. For, in this year, 1444, Europe may be said to have made a distinct beginning in the slave trade, henceforth to spread on all sides, like the waves upon stirred water, and not, like them, to become fainter and fainter as the circles widen."

We shall not pursue the tale after the death of Prince Henry. It relates to the progress of discovery along the African coast to the Cape of Good Hope, the building of forts and establishing of marts for the slave trade, and other incidents as they grew out of the new intercourse between Europe and Africa. We trust we have afforded a sufficient taste of the volume to induce many readers to seek in its pages for further information. The latter part relates to the discovery of America by Columbus, and his wars &c. in Hispaniola and the Continent; but though treated in a lively manner, the particulars are too generally known to induce us to make extracts, and we have only to say *vale to the pleasant book we now recommend to others.*

MR. COOPER'S NEW BED-INDIAN ROMANCE.

The Bee Hunter; or, the Oak Openings. By the Author of "The Pioneers," &c. &c. 8 vols Bentley.

MR. COOPER has got again upon such grounds as made "The Last of the Mohicans" so deservedly popular. Whether he has now succeeded in eliciting a story equally interesting may be doubted. He is at home in Indian lingo and Indian life, and therefore his narrative is always characteristic and entertaining; but we feel the want of that concern in the issue which constitutes the true Epic—or, if you please, the true Romantic or Novel power; and, as the figures "come like shadows, so depart," we enjoy the phantasmagoria, but care not how the bits of pasteboard are tumbled up or down at the end of the exhibition. The Bee-hunter must be received by this light. None of the people, nor of the incidents, awaken any emotion in our breasts—they may perish or escape, without our sorrowing or rejoicing; but still, as a picture, the handling, somewhat spun out, is clever, and, to the ordinary reader, the Bee-hunter offers a nice comb to suck, though not a hiveful of sweets. It may be a little waxy, but it is not a e(s)ell.

The declared object of the writer is to vindicate the ways of Providence, generally, against narrow-minded conclusions, from instances of individual, partial, or national undeserved sufferings; but the principle is not very clearly elucidated by the tale.

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chigan wild and forestic, with only a few roaming Palefaces to disturb its solitudes, or encounter the Indian perils of its Red-race resentments and fears.

The scene opens with a strange casual meeting, in this remote region, of two white men and two red. From their colloquy, it is discovered that a war is about to commence between the English and Americans—the hatchet has been unburied, and so forth. The individuals then assume their parts. The hero, Ben Buzz, alias Boden, (*the Drone*, so called by the French voyageurs) and sundry other nicknames or soubriquettes, stands foremost. He is a bee-hunter, or gatherer of honey, and the account of his occupation is very curious. Next to him we have Gershon Waring, or “Whisky Centre,” a drunken Yankee (with a wife and sister somewhere off), half acute, and half lost in his love of the bottle. The Indians are a young Chippewa, the type of the Indian family, of scalping mania, and a Pottawattamie, who is soon disposed of, being murdered and scalped by his countryman, who is in the American interest, though pretending the reverse, and knows the other to be inclined to the Britishers.

Out of this fourfold root the matter springs. Bourdon shows the party how he detects the honey-stores; and the process is so curious, that we are only sorry to say it is too long for extract. A small morsel may indicate the rest:

“The tools of Ben Buzz, as Gershon had termed these implements of his trade, were neither very numerous nor very complex. They were all contained in a small covered wooden pail, like those that artisans and labourers are accustomed to carry for the purposes of conveying their food from place to place. Uncovering this, le Bourdon had brought his implements to view, previously to the moment when he was first seen by the reader. There was a small covered cup of tin; a wooden box; a sort of plate or platter, made also of wood; and a common tumbler, of a very inferior, greenish glass. In the year 1812, there was not a pane, nor vessel, of clear, transparent glass, made in all America! Now, some of the most beautiful manufactures of that sort, known to civilization, are abundantly produced among us, in common with a thousand other articles that are used in domestic economy. The tumbler of Ben Buzz, however, was his countryman in more senses than one. It was not only American, but it came from the part of Pennsylvania of which he was himself a native. Blurred, and of a greenish hue, the glass was the best that Pittsburg could then fabricate, and Ben had bought it only the year before, on the very spot where it had been made.

“An oak, of more size than usual, had stood a little remote from its fellows, or more within the open ground of the glade than the rest of the ‘orchard.’ Lightning had struck this tree that very summer, twisting off its trunk at a height of about four feet from the ground. Several fragments of the body and branches lay near, and on these the spectators now took their seats, watching attentively the movements of the Bee-hunter. Of the stump Ben had made a sort of table, first levelling its splinters with an axe, and on it he placed the several implements of his craft, he had need of each in succession.

“The wooden platter was first placed on this rude table. Then le Bourdon opened his small box, and took out of it a piece of honey-comb, that was circular in shape, and about an inch and a half in diameter. The little covered tin vessel was next brought into use. Some pure and beautifully clear honey was poured from its spout, into the cells of the piece of comb, until each of them was about half-filled. The tumbler was next taken in hand, carefully wiped, and examined, by holding it up before the eyes of the Bee-hunter. Certainly, there was little to admire in it, but it was sufficiently transparent to answer his purposes. All he asked was to be able to look through the glass in order to see what was going on in its interior.

“Having made these preliminary arrangements, Buzzing Ben—for the sobriquet was applied to him in this form quite as often as in the other—next turned his attention to the velvet-like covering of

the grassy glade. Fire had run over the whole region that spring, and the grass was now as fresh, and sweet, and short, as if the place were pastured. The white clover, in particular, abounded, and was then just bursting forth into the blossom. Various other flowers had also appeared, and around them were buzzing thousands of bees. These industrious little animals were hard at work, loading themselves with sweets; little foreseeing the robbery contemplated by the craft of man. As le Bourdon moved stealthily among the flowers and their humming visitors, the eyes of the two red men followed his smallest movement, as the cat watches the mouse; but Gershon was less attentive, thinking the whole curious enough, but preferring whiskey to all the honey upon earth.

“At length le Bourdon found a bee to his mind, and watching the moment when the animal was sipping sweets from a head of white clover, he cautiously placed his blurred and green-looking tumbler over it, and made it his prisoner. The moment the bee found itself encircled with the glass, it took wing and attempted to rise. This carried it to the upper part of its prison, when Ben carefully introduced the unoccupied hand beneath the glass, and returned to the stump. Here he set the tumbler down on the platter in a way to bring the piece of honey-comb within its circle.”

He thus confines and gorges several bees, lets them go—and so traces the riches collected in the hollow tree.

The author’s distaste for aught English is, as usual, brought into play. Bourdon, it seems, “knew enough of the history of the past, to be fully aware that, in all periods of American history, the English, and, for that matter, the French, too, so long as they had possessions on this continent, never scrupled about employing the savages in their conflicts. It is true that these highly-polished, and, we may justly add, humane nations—(for each is out of all question entitled to that character in the scale of comparative humanity as between communities, and each, if you will take its own account of the matter, stands at the head of civilization in this respect)—would, notwithstanding these high claims, carry on their *American* wars by the agency of the tomahawk, the scalping-knife, and the brand. Eulogies, though pronounced by ourselves on ourselves, cannot erase the stains of blood. Even down to the present hour, a cloud does not obscure the political atmosphere between England and America, that its existence may not be discovered on the prairies, by a movement among the Indians. The pulse that is to be felt *there*, is a sure indication of the state of the relations between the parties. Every one knows that the savage in his warfare slays both sexes and all ages; that the door-post of the frontier cabin is defiled by the blood of the infant, whose brains have been dashed against it; and that the shuddering ruins of log houses, oftener than not, cover the remains of their tenants. But, what of all that? Brutus is still ‘an honourable man,’ and the American, who has not this sin to answer for among his numberless transgressions, is reviled as a semi-barbarian! The time is at hand when the Lion of the West will draw his own picture, too; and fortunate will it be for the characters of some who will gather around the easel, if they do not discover traces of their own lineaments among his labours.”

Elsewhere we may note another of these foolish national and narrow exhibitions, so remote from the true and generous.

“Here the corporal, without knowing it, made some such reproach to the aboriginal warriors of America as the English used to throw into the teeth of ourselves, that of not standing up to a weapon which neither party possessed. It was matter of great triumph that the Americans would not stand the charge of the bayonet at the renowned fight on Breed’s, for instance, when it is well known that not one man in five among the colonists had any such weapon at all to ‘stand up’ with. A different story was told at Guildford, and Stony Point, and Eutaw, and Bennington, and Bemis’ Heights, and fifty other

places that might be named, after the troops were furnished with bayonets. Then it was found that the Americans could use them as well as others, and so might it have proved with the red men, though their discipline, or mode of fighting, scarce admitted of such systematic charges.”

What pitiful work this is; a comment would be thrown away upon it.

The Bee-hunter goes down the river to Gershon’s, falls in love with his sister, “The Blossom,” or heroine, at sight, who falls equally in love with him; spills all the whiskey in the store; and they fly from an Indian approach. Pigeonwing is made a prisoner, and rescued by Bourdon; a mysterious Indian, named Peter, is introduced with a Methodist missionary and a bold corporal of the United States; and events are hurried on in quick succession. We stop for a portrait:

“‘Amen’ was not the real name of the missionary, but it was a *sobriquet* bestowed by the soldiers, on account of the unction with which this particular word was ordinarily pronounced, and quite likely, too, because it was the word of all others most pleasant to their ears after a sermon or a prayer. It had by long use got to be so familiar, that the men did not scruple to use it to the good man’s face. This missionary was a Methodist, a sect that possessed in that day very few clergymen of education, most of its divines coming of a class in life that did not predispose them to take offence at light invasions on their dignity, and whose zeal and habitual self-denial had schooled them into a submission to far more positive personal privations than any connected with the mere tongue. That there are ‘wolves in sheep’s clothing’ among the Methodists, as well as among the other religious sects of the country, our daily experience shows: but the mind must be sadly inclined to believe evil of others which does not see, in the humble and untiring efforts of this particular sect of Christians, more than mere fanaticism or hypocrisy can produce.”

This worthy enthusiast is at the close tomahawked by the Indians, and dies a most exemplary death.

We cannot, need not trace the current of incidents—the examples of Indian cunning, sagacity, taciturnity, mystifying, scalping, massacring! Peter the mysterious is converted by the Christian prayers of the missionary, and from contemplating deeds of blood, at last, in conjunction with Pigeonwing, saves the hero and heroine. There is a grand Indian chief council; there are the deaths of the missionary and the corporal; there are many religious discussions; there are the causes of the Indians desiring to rid themselves of the White aggressions upon their hunting grounds; and there are many other things which we would advise readers to read in the words of Mr. Cooper. We quote the death of the missionary, as a specimen of the most serious portion of the novel:—

“As Ungue, and those associated with him, led the missionary to the place of execution, the former artfully invited Peter to follow. This was done simply because the Weasel saw that it would now be unpleasant to the man he hated—hated, merely because he possessed an influence that he coveted for himself.

“‘My father will see a pleasant sight,’ said the wily Weasel, as he walked at Peter’s side, towards the indicated spot; ‘he will see a pale-face die, and know that his foot has been put upon another worm.’

No answer was made to this ironical remark, but Peter walked in silence to the place where the missionary was stationed, surrounded by a guard. Ungue now advanced, and spoke.

“‘It is time for the medicine priest of the pale-faces to start after the spirits of his people who have gone before him,’ he said. ‘The path is long; and unless he walks fast, and starts soon, he may not overtake them. I hope he will see some of them that helped to kill the Son of his Great Spirit, starving, and foot-sore, on the way.’

“‘I understand you,’ returned the missionary, after a few moments passed in recovering from the shock of this communication. ‘My hour is come. I have held my life in my hand ever since I first put foot in this heathen region; and if it be the Creator’s

will that I am now to die, I bow to the decree. Grant me a few minutes for prayer to my God."

"Ungue signed that the delay should be granted. The missionary uncovered his head, knelt, and again lifted up his voice in prayer. At first the tones were a little tremulous; but they grew firmer as he proceeded. Soon they became as serene as usual. He first asked mercy for himself, threw all his hopes on the great atonement, and confessed how far he was from that holiness which alone could fit him to see God. When this duty was performed, he prayed for his enemies. The language used was his mother tongue; but Peter comprehended most of that which was said. He heard his own people prayed for; he heard his own name mentioned, as the condemned man asked the mercy of the Manitou in his behalf. Never before was the soul of this extraordinary savage so shaken. The past seemed like a dream to him, while the future possessed a light that was still obscured by clouds. Here was an exemplification in practice of that divine spirit of love and benevolence which had struck him, already, as so very wonderful. There could be no mistake. There was the kneeling captive, and his words, clear, distinct, and imploring, ascended through the cover of the bushes to the throne of God.

"As soon as the voice of the missionary was mute, the mysterious chief bowed his head and moved away. He was then powerless. No authority of his could save the captive; and the sight that so lately would have cheered his eyes, was now too painful to bear. He heard the single blow of the tomahawk which brained the victim, and he shuddered from head to foot. It was the first time such a weakness had ever come over him. As for the missionary, in deference to his pursuits, his executioners dug him a grave, and buried him unmitigated on the spot where he had fallen."

The fate of the corporal is far more graphic and striking; but we will not deprive our readers of the interest of its thirty or forty pages by an indistinct report. We conclude with the Chippewa's last counsel to the Blossom:-

"Blossom, listen to my words; he at length answered. 'They are such as a fader would speak to his daughter. You my daughter. Tell you so once; and what Injin say once, he say alway. Poor, and don't know much, but know how to do as he say he do. Yes, thou my daughter! Bear's Meat can't touch you, widout he touch me. Bourdon your husband; you his squaw. Husband and squaw go togederal, on same path. Dat right. But, Blossom, listen. Dere is Great Spirit. Injin believe dat as well as pale-face. See dat is so. Dere is Great Wicked Spirit, too. Feel dat, too; can't help it. For twenty winter dat Great Wicked Spirit stay close to my side. He put his hand before one of my ear, and he put his mout' to tudder. Keep whisper, whisper, whisper, day and night, neber stop whisper. Tell me to kill pale-face, wherever I find him. Bess to kill him. If didn't kill pale-face, pale-face kill Injin. No help for it. Kill ole man, kill young man; kill squaws, papoose, and all. Smash eggs and break up 'e nest. Dat what he whisper, day and night, for twenty winters. Whisper so much, was force to b'lieve him. Bad to have too much whisper of same t'ing in ear. Den, I want scalp. Couldn't have too much scalp. Took much scalp. All pale-face scalp. Heart grow hard. Great pleasure was to kill pale-face. Dat feeling last, Blossom, till I see you. Feel like fader to you, and don't want your scalp. Won'er great deal why I feel so, but do feel so. Dat my natur'. Still want all udder pale-face scalp. Want Bourdon scalp, much as any.'

A slight exclamation from his companion, which could scarcely be called a scream, caused the Indian to cease speaking."

Mr. Cooper concludes with a vivid contrast of the change in these parts within only thirty-six years; but we have done enough to illustrate his new romance of the Red-skins, and shall now take our leave of it, recommending it, with all its faults, to that popularity which its vivid pictures and descriptions of Indian life so justly deserve.

ITALY. *Italy in the Nineteenth Century, contrasted with its Past Condition.*

(Third Notice.)

THE preaching of Padre Ventura is vividly described, and we copy a singular bit of the description:

"Right eloquently did he harangue for three-quarters of an hour, being the most easily understood by a foreigner, of all Italian speakers or preachers I ever heard. It must not be supposed the vigorous divine spoke without cessation; on the contrary, he wisely divided his discourse into compartments, and after an impetuous torrent of twenty minutes, received by the audience in silent attention, down he sat, and this was the signal for an universal burst of coughing, nose-blowing, and spitting, practice most convenient—for in England, in the influenza months, a constant barking is maintained during the sermon, against which the preacher can hardly bear up; whereas in Italy, by a violent effort of nature, all the disagreeable customs of the people are repressed while the preacher speaks, and explode when he stops. Padre Ventura arises with renewed vigour, and declaims with unhesitating fluency a quarter of an hour, closing this part of his discourse with an incentive to alms-giving; when he sits down there is another fit of coughing, during which boys hand round bags suspended to long poles, collecting jacobochi; every person gives a little. In the same interval an indulgence was proclaimed, on certain conditions, to be performed the ensuing Sabbath. Il Padre Ventura arises for the third time like a giant refreshed with sleep, and sweeps onward in his course in a whirlwind of declamation; the subject lastly touched on inflames his eloquence—the Church—the ancient Church—the only Church—the infallible Church—the true Church—the charitable Church—the apostolic Church—the falseness of all other Churches—the dismal fate of heretics and unbelievers—the joyful triumph of the faithful, and those who, like the audience, believe in her. Suppressed sighs were just audible; the preacher had done, the people were dismissed with a benediction: they to an immortality of bliss through the Church, all heretics to eternal flames. The congregation seemed highly pleased with this positive announcement of the judgment to be awarded in a future state by Almighty God."

We continue our progress, and "drive towards the Piazza S. Apostoli, where stands a church, which contains the earliest works of Canova. There is a large portico in front, and under it is a monument to Giovanni Volpato, who is said to have been an attached friend of the great artist. It represents Friendship weeping before a bust of the deceased. In the interior of the church, which otherwise is not remarkable, is another work of Canova, being a monument to the memory of Clement XIV. (Ganganelli, the same who suppressed the Jesuits.) It consists of a sitting statue of the Pope, and two figures, representing Temperance and Clemency. This was executed when Canova was twenty-five years of age. There is a third monument erected by Canova to the memory of a Venetian senator, Falieri. Now, I cannot say these works struck me as exhibiting proofs of commanding talent; that of the Pope's is the finest. It is, however, very interesting to see the first efforts of a man of genius. In Perugia we behold a Madonna, the earliest production of Raffaelle's pencil; and here are the first efforts of Canova. How different both artists in their mature fame, when industry had perfected their natural gifts! Undoubtedly Raffaelle exhibited in youth a brighter promise, and will retain a more lasting renown. It would be heresy to doubt his greatness—not so with Canova. This church is said to contain also the heart of Maria Clementina, wife of the Pre-tender."

"We now reach the Porta Latina, and there dismiss our carriage.

"The object of our visit is to examine what has been represented, and truly, as a very remarkable Columbaria, although not described in the guide-books. Passing through a garden close to the walls

of ancient Rome, we stopped before (what appeared) a low-roofed flat building, the walls of which were studded with old Roman epitaphs, imbedded in the plaster; a door was opened, and we found ourselves on the first step of a flagged stone stair. It was the striking accidentally on this flagging which led to the discovery of the old Columbaria. What a wonderful spectacle was this! The ancient steps were quite perfect—about eighteen, I think, in number—leading down to a dry flagged floor. The chamber was square, or nearly so, and all around were rows of niches, each to contain the osses or urns in which the ashes of the dead were deposited. Sometimes the ashes of a whole family were inclosed in one urn. Inscriptions were placed over the niches, and many of them were not only legible, but fresh. In the centre of the chamber stood a large square column, supporting the roof; the sides of it containing also niches and urns. Several persons of distinction were buried here. I read the inscription of one Valerius, surnamed Creticus, it is said, from the conquest of Crete. It was a habit of the Romans so to name distinguished citizens. On a ledge in front of some of these niches were little vessels with a small aperture in the cover, into which libations were poured of wine, oil, milk, &c., by the friends of the deceased. The roof over this Columbaria is new; the whole had been filled with light earth, but not damaged. It was capable of containing the ashes of 1100 persons, and is believed to have been constructed to receive the remains of the officers and freed men of the Caesars attached to their prodigious palace on the Palatine, not very far distant. The word columbaria is used from the rows of little niches, resembling the holes of a pigeon house. There are several of them in the neighbourhood of Rome, but none more perfect or extensive than this. I had seen nothing so remarkable even in Pompeii. We have here a complete exhibition of the ancient mode of burial of the Romans revealed after a lapse of nigh two thousand years. We saw in the same vineyard another columbaria, said to have belonged to the family of Pompey, in process of excavation, and carried off a little trophy in the shape of a small earthen urn. Beholding the contents of these urns, we may exclaim, in the language of Ezekiel, 'Can these dry bones live!'

"For the interesting spectacle we have here witnessed we are indebted to the labours of that indefatigable antiquarian and accomplished gentleman, the Cavaliere Campana, under whose skilful superintendence the excavations were originally made and will be continued, and by whose advice this Columbaria has been restored so as to exhibit to our view what the exact appearance of such a receptacle for the dead was in Ancient Rome."

"Leaving Caracalla's Therme, we find ourselves in a quarter of an hour at the extremity of the Circus Maximus, the site of which was at the base of one side of the Palatine, and in view of the haughty Caesars as they exulted in their Golden House. Should we turn to our left, and proceed between the Circus and the Palatine, we have above our heads the platform belonging to the villa known by the unclassic name of Mills. Mr. Mills, inspired by a laudable ambition to dwell where his respectable predecessors the Caesars had dwelt before him, purchased a corner of the mighty ruin, and built a villa, and then, like a true Englishman, called it after his classic name, 'the Villa Mills.' His grounds are neatly laid out, and the lofty terrace over our heads faces the Circus. Entering from the Roman Forum, you can walk across the pleasure grounds of Mr. Mills, the arrangements of which would reflect honour upon Hackney, and asking yourself what Nero would have thought of this imitation of his genius, descend to the subterranean chambers, which fortunately cannot be improved. From the elevated platform you may view the Circus beneath, and the Campagna beyond; puzzle yourself by endeavouring to make out the dimensions of the Imperial Palace, and congratulating Mr. Mills on his excellent taste, depart.

"That the house of Augustus was somewhere hereabouts, from the description of Canina, we may believe. From the position assigned to it on the

topography to the place where the emperor Augustus and the 1st century had the imitative of the Cæsars. Colonne succeeded ancient remains of earth. At the Barlabourers and the walls after the exposed chambers conclude adjoining height fair.

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steps were a number chamber rows of which the times the one urn and many In the column, nning also expostion were Valerius, inquest of to name of some small aper- were poured deceased, whole had aged. It persons, to receive on of the columbarium, enabling the of them more per- nothing so were a com- of the thousand per colum- Pompey, "a little Behold—claim, in- tates live!" here wit- that inde- gentle- man superin- made and s Colum- our view stacle for ourselves the Circus use of one y Ceasars should we circus and platform his name ambition sur- sors the corner of, like a name, laid out, the Circus can walk arrange- Hackney, thought of e subter- may view beyond: out the conti- nating there here- we may on the

topographical map, a view of the Circus was secured to the plausible tyrant, and therefore our English squire may imagine himself seated with the crafty emperor and his agreeable guests, Mæcenas, Agrippa, and the poets—fancy their conversation, recall their classic humour, and may still season his repast with the inimitable wit of Horace.

"The cabbage now flourishes on the spot where the Caesars dwelt in grandeur."

Colonel Smith, another not uncommon name, has succeeded Mr. Mills in this abode. The discovery of ancient relics must be endless, for the accumulation of earth and rubbish in many parts is prodigious. At the Baths of Livia, for example, we are told, "the labourers get torches and descend with the visitor; and it is most astonishing to behold the gilding on the walls fresh, the paintings clear and even bright after the lapse of ages: the place is dry, and not exposed to the air. It is difficult to suppose such chambers were built underground; we must therefore conclude that the Palatine Hill (as well as the adjoining valleys) has been heaped with soil to a height far above its original elevation."

The history of the miraculous Bambino may be referred to as a specimen of the way in which the author treats such matters; and visits to the courts of law are redolent of strange statements. After witnessing civil actions, our countryman goes on to say:

"We next requested our courteous guide to introduce us to the criminal court. He showed us a closed door leading to a chamber wherein a criminal cause was proceeding, but regretted he could not gratify our curiosity, inasmuch as he himself had no right of entrance. The judges, the prisoner, his advocate, the procuratore fiscale prosecuting, and the guard, were the only persons permitted to be present at the trial. No relative or friend of the accused dares to cross the threshold of the court, no part of the evidence, trial, or sentence, can be published; the proceedings of the criminal tribunals are wrapped in impenetrable mystery. Mr. Packenham asked, within what time after his arrest must a prisoner be tried? The advocate answered, there was no time fixed, nor any means of enforcing a trial; he admitted a prisoner might be from one to eight years in gaol, without being brought before any legal tribunal. This gentleman was a stranger to us, until the day of our visit; he said nothing against the system of Roman Criminal Justice, he merely described it; we took our leave, having learned something, even by a first visit to the courts of justice in the Eternal City. I confess the contrast between the meanness of the judicial, and the excessive splendour of the ecclesiastical system, surprised me. I had beheld the unrivalled grandeur of the Church in Rome, its pompous ceremonies, splendid churches, the gorgeous finery of its priests—in comparison the courts of justice resembled a barn, or hay-loft, and its administrators were only on a level with the humblest sacraments."

"I had an opportunity, on the evening of the day of this visit to the civil tribunals, of learning the exact position in society of the Roman advocate. The profession of the law is considered by the higher classes to be a base pursuit: no man of family would degrade himself by engaging in it. A younger son of the poorest noble would famish rather than earn his livelihood in an employment considered vile. The advocate is seldom, if ever, admitted into high society in Rome; nor can the princes (so called) or nobles comprehend the position of a barrister in England. They would as soon permit a *faccino* as an advocate to enter their palaces, and they have been known to ask with disdain (when accidentally apprised that a younger son of an English nobleman had embraced the profession of the law) what could induce his family to suffer the degradation? Priests, bishops, and cardinals, the poor nobles, or their impoverished descendants, will become—advocates or judges, never. The solution of this apparent inconsistency is to be found in the fact, that in most despotic countries the profession of the law is contemptible. In Rome it is particularly so, because no person places confidence in the administration of the law—the salaries of the judges are small, the re-

munerations of the advocate miserable—and all the great offices grasped by the ecclesiastics, pure justice not existing, every body concerned in the administration of what is substituted for it, is despised, often most unjustly, as being a participant in the imposture. I write it with pain, but I remember being present when a gentleman of fortune, referring to a troublesome squabble into which he had got with a Roman tradesman, said, 'My courier tells me I must give ten scudi to the judge, in order to receive a decision in my favour.' It may be suspected the rascal said this to secure the bribe for himself; but the fact that a native of Rome would make such a declaration, and that it could be credited, proves the reputation in which the administration of justice must be held. My curiosity to witness a criminal trial was whetted—but I could not accomplish that while Gregory reigned."

That reign approached its close.

"After a residence of some months, I perceived an universal gloom pervaded Rome, and as universal a discontent. When the Pope appeared, no man said, God bless him; of the cardinals as a body, I scarce ever heard a kind observation made; generally, the language applied to them was expressive of contempt, but chiefly in reference to their political government.

"I have heard the people complaining of any abuse, say, 'This comes of being governed by *men in red*, or by old men in red.' In Bologna I heard a man apply to the Cardinal Legate, the expression, '*old woman in red*' Reverence for the Government, or respect for the law, there was none. This feeling of contempt had descended to the lowest classes. I chanced to inquire from an attendant in one of the principal hotels, whether he knew if letters were opened (as rumoured) in the post-office. He replied, 'As many as two thousand were opened during the last insurrection, but the practice was given up latterly'; then he moralized, 'Better for the people to remain quiet; if,' said he, 'it was left to ourselves, we would soon settle him, (the Pope); but as we know Austria would crush us, it is wiser to wait.' There was candour and good sense in the remark."

"To comprehend accurately what was the political government of the Papacy in the nineteenth century,—of what evils the Italians had really to complain,—in what style a political writer discusses national grievances,—what facts he narrates,—we cannot apply to a better source than the forbidden book of the Marchese Massimo D'Azeglio. It has all the value of history, and has produced an amazing effect throughout Italy."

"Having studied the above historical narrative of the Government of Pope Gregory XVI. (especially as it existed in its latter years,) sketched by a man of virtue, a sincere Roman Catholic, one thoroughly acquainted with his subject, and incapable of falsehood, we have laid bare to our view the vices, cruelties, and enormous abuses coupled with the intolerable despotism of the Papal system.

"Yet nothing would be more erroneous than to visit the odium of this mass of injustice and absurdity on the Pope.

"I had the honour of being presented to him. On his face were stamped kindness, good nature, I might say innocence. There was no blemish on his morals, he was virtuous in private life, and possessed of theological learning: I will not believe he could of himself be guilty of an act of cruelty or even unkindness. But he was a monk, and had the capacity of a monk for civil government.

"Elevated to an absolute sovereignty for which he was disqualified by education, habit, experience, he knew not which way to turn amid the storms which assailed him. Naturally, he leaned on the iron despotism of Austria: his minister, Cardinal Lambruschini, a remorseless politician, must chiefly bear the blame of having caused, or, at least, aggravated, the dreadful evils Massimo Azeglio has exposed; and the ridiculous system of government which made a monk a despotic Prince is to be reprehended, and not the individual. That sixty venerable and pious priests should elect a bishop seems not at all inconsistent with reason, but that the bishop so

chosen should possess absolute temporal authority is manifestly so.

"We may derive another important lesson from the perusal of this tract—that an educated Roman Catholic expresses his opinions on the misgovernment of his Church with sincerity, truth, and an unflinching boldness. In what he has written he has laid bare the absurdity of the Pope's temporal government, and he appears to have the lowest opinion of the moral teaching and education afforded by the Papacy, in its spiritual character, to its subjects. He and the thousands who in Italy think with him, would manfully reform both church and state in Rome with an unsparing hand. The secular education of the people, Azeglio would, it may well be believed, take wholly out of the hands of the priests. At the very time this terrible exposure of the Papacy was written, wonderful as it may appear, a body of educated men in Oxford repudiated the tolerant Church of England, and declared their belief that the system of Papal Rome was not only to be preferred, but that it was perfect. The charitable conclusion to draw is, that these gentlemen, living in their university, secluded from the world, were captivated by the grand idea of one perfect Church overspreading the earth, and governing consistently the Christian world, than by a violent stretch of imagination, conceived Rome to be that infallible Church, and abhorring all difference of opinion, and the toleration from which it springs, apostatize to that Church which represses heresy by crushing freedom. A tree is to be judged of by its fruits. What were the fruits of the Papal system? The sealing up the Scriptures, the interdiction of knowledge, false teaching, flagitious temporal government, alternately the ridicule and scorn of the people, and what was more dreadful, according to the proved statements of Massimo Azeglio, an open denial of justice.

"Heartily may we unite with him in wishing to the Roman people improved institutions and rational freedom!"

With this we must break off for the present, though we reserve the concluding volume for another notice.

Paul Clifford. By Sir E. B. Lytton, Bart. Chapman and Hall.

To this last issue of the new edition of Sir E. B. Lytton's works are prefixed a clever etching by H. K. Browne, and a few prefatory remarks by the author, which are the more to be prized as they afford, though a brief, an interesting psychological, literary, biographical idea (to coin a good Germanizing phrase for the nonce) of Sir Edward's mental progress in, and elimination of his art, as illustrated by his successful publications. In this preface he also evokes that spirit which is now stirring on behalf of the ignorant and criminal portion of our population; and lends his potent aid to the cause of social reform, which has at last come to be universally felt and acknowledged as the grand desideratum of the age and country. It is here only a voice raised; let us hope that he will bend his genius more earnestly to an effort to advance the good cause.

What has Religion to do with Politics? By D. R. Morier, Esq. Parker.

THAT all politics should be founded on the principles of the Christian religion, and that the rulers as well as the ruled ought to have no other standard of right or morality. The truths are not of a novel description, but they are propounded with much dialectic skill and ability. Mr. Morier relates a pregnant observation of a Parisian professor, which may well account for a succession of revolutions. "Our misfortune is (said he), that we not only do not believe in anything, but we have even lost the faculty of believing!"

The Faith and Practice of a Church of England Man. By W. Stanley, D.D. With Notes, &c. by the Rev. R. Eden, M.A. Pickering.

A REPRINT of the Dean of St. Asaph's work on behalf of the Protestant Church, of which he was an ornament a century and a half ago. He died aged 85, in 1731. It is edited in a like spirit, with a memoir of the learned author.

ARTS AND SCIENCES.

THE BRITISH ASSOCIATION: SWANSEA.

In our last *Gazette* we brought up the Report of Proceedings as far as time and space permitted; and purpose to continue it in the same manner, so as not to fatigue our readers with too much science every week, and leave sufficient room for literature (including the Archaeology from Worcester) and the other branches, which make the green tree of our Journal. It is also our intention (as we premised) to relieve the formal and dry course of sectional work, by giving such entire papers as appear to us to be of the greatest scientific importance; especially such as are of local application to the district where we met, and also others of popular, as they are of national, interest. We now take up the threads of our web with—

THURSDAY.

Section G.—(Mechanics.)

1. Glynn, (Mr. J.), report on hydraulic pressure engines.
2. Whishaw, (Mr. F.), on the "Velocimeter," with its applications.
3. Whishaw, (Mr. F.), on a sub-marine rope for telegraphic communications.
4. Roberts, (Mr. R.), on a new element of mechanism.
5. Struve, (Mr. W. P.), on a new apparatus for the ventilation of mines.

1. Mr. Glynn brought before the section the employment of high falls of water to produce a reciprocating motion by means of the pressure engine, as he had before done (see Report for 1847) with respect to the production of rotary motion by means of the Turbine. The pressure engine acts by the power of a descending column of water upon the piston of a cylinder to give motion to pumps for raising water to a different level, or to produce a reciprocating motion for other purposes. In mountainous districts, so often containing great mineral wealth, waterfalls may be found of a much greater height than can be practically brought to bear upon water wheels, and the stream is often too small in quantity to produce the desired effect on a water wheel within the ordinary limits of diameter. In such situations the pressure engine is well adapted to give great mechanical effect from a fall of water, in working pumps and machinery for draining mines. The Germans appear to have made successful improvements upon their original engines, and, from time to time, to have extended their usefulness and application. Of these, two important examples were given; but, as Mr. Glynn's paper is one of those for insertion at length in the volume of the year, we shall confine our notice to an account of the powerful engine constructed under Mr. Glynn's direction at the Alport mines, near Bakewell in Derbyshire. The cylinder is 50 inches in diameter, and the stroke 10 feet. It is worked by a column of water 132 feet high acting below the piston, and lifting by direct action a weighted plunger pole, which raises the water from the mine to a height of 132 feet; so that the proportion of power to effect is as the area of the piston to that of the plunger—namely, 1693 to 1835, or full 70 per cent. The usual speed is about five strokes per minute; but it will work at the rate of 7 strokes without any concussion in the descending column: the duty actually done being then equal to 168 horses' power. The pressure upon the piston from a column of water of 132 feet, reckoning 27 inches of water equal to 1 lb., is about 58 lbs. on the square inch, or rather more than 50 tons upon the area of the piston. This engine was erected early in 1842, has been at work without interruption for more than six years, and has never cost £12. a year. On one occasion Mr. Glynn was told that it had been going for seventeen weeks without any one seeing it during that time.

In this case, as in all others when water acts by its gravity or pressure, these machines do the best duty when the water enters the machine without shock or impulse, and quits it without velocity. Thus is obtained all the available power that the water will yield, with the least loss of effect; and this result is best accomplished by making the pipes and passages of sufficient size to prevent acceleration of the hydrostatic column.

Mr. Glynn's paper led to considerable discussion;

and, indeed, we may observe, that nearly all mechanical topics and improvements which are brought forward, give rise to the expression of much difference of opinion among the very ablest and best informed of the leading men engaged in the pursuit of those vast and important matters which depend on this science. The consequence is, that a certain conclusion is seldom if ever arrived at; and thus, interesting as these debates, with the incidental remarks they elicit, are, they do not in reality increase our knowledge by the absolute decision of the points or questions at issue. In the course of the discussion, however, Mr. Scott Russell gave a remarkable description of the means resorted to by Mr. Thom, of Greenock, in damming up the water in ravines suitable for the purpose, and thus being able to procure a constant supply for mills and manufactories, without waste, and serving the purposes of the country round in a better manner than when the streams ran at liberty in their natural courses. He had surveyed some of the hills and valleys about Swansea, and found that they might be made available for the same useful ends. His account of Mr. Thom's simple and ingenious contrivances created a strong sensation among the audience; particularly the application of a bucket perforated at the bottom, and a balance so adjusted that the water from the reservoirs was regulated exactly as the want of it was required, and the supply was always kept at an adequate amount. Mr. Russell also enlarged on the immeasurable value of water power, and congratulated those parts of the country where rain fell in sufficient quantities to furnish this agent. He mentioned that the average of Britain was from 27 to 30 inches per annum; but that in some localities which he knew, the fall was 60 or 70 inches; and a friend near him (who was a credible witness) had just assured him that on some hills in Lancashire (we think) it amounted in one year to no less than 180 inches. [This, however, seems to us to be a mistake, and hardly credible.]

Mr. Roberts, speaking on the same subject, and not subscribing altogether to Mr. Glynn's opinions, that conflicting registers of the fall of rain were caused by the position of the gauges at various heights, considered that the most correct results were obtained from those at six inches from the ground.

2. The velocimeter was first invented by Mr. Whishaw in 1839, for the purpose of taking more readily than by an ordinary watch furnished with a second-hand, the time occupied in passing over measured distances. Its novelty and use consisted, first, in the substitution of a central decimal hand for the ordinary second hand, whether placed centrally or ex-centrally, so that the time could be taken to the one-hundredth part of a minute; and secondly, in surrounding the dial by an annular space containing the velocities tabulated from 12-60 miles per hour, up to 75 miles per hour, taking for a basis the usually measured railway distance of a quarter of a mile; if the distances are in half miles, half of the tabulated velocity must be taken. In making a single observation by this plan, it was necessary to note the decimal division at the time of passing the first standard, and also the decimal division at the time of passing the next post, and having subtracted the one from the other, to look to the table for the result. By the improved velocimeter, which has the addition of a moveable annular plate, on which the table of velocity is engraved, instead of on the fixed dial as by the first plan—a single experiment may be made by one observation, thus:—In passing the first quarter of a mile standard, the central hand is made to coincide therewith, and also with zero (100) on the table, and when the next quarter of a mile standard is passed, the tabulated figures opposite to the central hand, gives the velocity required. If, however, a series of experiments are to be made, a book ruled in columns, with directions, is necessary. The instrument, which resembles a handsome chronometer, was exhibited, and it was stated it had tabulated 10,000 of miles without being out 100th part of a minute. The inventor also stated that by it, with the aid of the electric telegraph, the time of the kingdom could be made uniform to half a second.

4. Mr. Roberts explained the construction of a mechanical contrivance by which may be effected in a very simple manner, movements for which more complicated mechanism is frequently employed. The model consisted of a steel shaft, on which were (fitted closely) two brass discs, having each a boss to keep it steady. One of the discs had eleven teeth (rounded at top and bottom) in its circumference, and was placed on the body of the shaft; the other disc (which was rather the larger) was on the eccentric portion of the shaft, with its face to that of the toothed disc. The plain disc had four studs riveted into it at equal distances from each other, and at such distance from its centre as to admit of their being brought successively, by the revelation of the eccentric, to the bottom of the hollows in the toothed disc.

The following movements may be effected by the model, namely, if the shaft be held stationary, and the discs be made to revolve upon it, one of the discs will make twelve revolutions, whilst the other makes only eleven. Again, if the toothed disc be held, whilst the shaft be made to revolve twelve times, the plain disc will revolve in the same direction one revolution only; and if the plain disc be held, the toothed disc will perform one revolution in the contrary direction for eleven revolutions of the shaft. It will be evident that almost any other number of revolutions may be produced by employing a smaller number of studs, not fewer than three, which will not divide the number of teeth in the disc. The idea of this novel element of mechanism was suggested to Mr. Roberts by a dial movement in an American clock. The description of this new "alphabet" of mechanism excited great interest.

5. Mr. Struve's communication described the ventilation of collieries to be produced by large furnaces being placed at the bottom of the upcast pits, the rarefaction created thereby causing the air to ascend, a similar quantity descending the downcast pit. The great objections to this system, he stated, were the variations which arose from neglect of the furnace men; also a like effect from barometrical and thermometrical changes in the atmosphere, which, when accompanied by sudden leakages of carburetted hydrogen gas from the goal of a mine, would be sufficient to produce extensive explosions. He also described the great destruction which arose to the flat chains, flat ropes, and the cast iron tubing of an upcast pit, causing large annual expenditure. He proposed as a remedy for these evils, a new mine ventilator, worked by a five horse power engine, which he had invented and patented, calculated to take out of a mine an unlimited quantity of air; this he did by converting the whole area of the upcast pit into an air channel which he connected with his ventilator by means of a culvert of a similar size. The ventilator consists of two large air chambers, something like gasometers, which he causes to move up and down in water, contained in a tank, constructed of masonry; the chambers balance each other and are surrounded with outside cases, so as to form double pumps. The inlet and outlet valves when open present the same amount of area as the upcast pit for the ingress and egress of the air, so that the only resistance to be overcome is ventilating the mine, in what arises from the friction of the air, in the passages of the mine, and in the parts of the apparatus which would be of small amount. He described a mine ventilator of this kind which was now in course of erection, on this principle, at the Eagle's Bush Colliery, calculated to pass through that mine 40,000 cubic feet per minute, the cost of which would be about 4000L.

FRIDAY.

SECTION A.—(Mathematical and Physical Science.)

1. Birt (Mr. W. R.), report on atmospheric waves.
2. Russell (Mr. J. Scott), on the effect on sound of the rapid motion of the observer.
3. Plucker (Prof., of Bonn), on some new relations of the diamagnetic force.
4. Brewster (Sir D.), on the visual impression upon the foramen centrale of the retina.
5. Brewster (Sir D.), on the vision of distance as given by colour.
6. Stokes (Mr. G. G.), on the perfect blackness of the centre of Newton's rings.

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7. Stokes (G. G.) on the refraction of light beyond the critical angle.
8. Stokes (G. G.), on a difficulty in the theory of light.

1. Mr. Birt's report was divided into three parts—the first having reference to the information we at present possess relative to such individual waves as have been determined by the discussions which occupied the author's attention during the last five years, under the auspices of the Association; the second, treating of the barometric curves which result at any station from the crossing of the north-westerly and south-westerly waves, the two principal systems common to Europe—the most prominent subject being that particular curve known as the "great symmetrical wave of November"; and the third, embodying the results that have been obtained during the last year, illustrative of the symmetry of the great wave, more particularly the locality of the greatest symmetry, and the departure of symmetry in certain directions. Each year's observations upon this interesting subject have been procured from an increased number of stations, and Colonel Sabine regretted that this should be Mr. Birt's final report.

2. Mr. Scott Russell directed the attention of the section to curious illustrations of the theory of sound—namely, the differences between sounds heard at rest, and at the velocities of railway trains, by a person standing by the side of the railway or by a passenger. For instance, the ringing of a bell, which is generally a fixed key-note; approaching it in a train, the sound to the traveller is more acute; after passing it more obtuse or grave; in the one case a greater number of vibrations arrive to the ear in a given time, in the other fewer. At the rate of fifty-six miles an hour, the increased vibrations amount to an ordinary semi-tone, and therefore by so much is the tone higher; the diminished vibrations after passing being likewise the same in amount, but of course by so much lower; so that in passing the bell there occurs a whole tone of change. This change is less abrupt if the train be passing at a certain distance—distance modifying the case; but Mr. Russell's ears are so accustomed to the change of tone, that in any case it is easy for him to say from it approximately at what velocity the train is travelling. In the instance of two trains meeting and whistling, each moving at the rate of fifty-six miles an hour, in respect of coming towards and going from each other 112 miles an hour, the difference of tone amounts to a major third, higher or lower, approaching or receding, and to two full tones during the whole passing. Next, in regard to the sounds of the train in which one is travelling: they are, though confused, resolvable into four kinds, continuous and nearly uniform, and relatively at rest. But meeting a bridge these sounds are reflected; they all come back a semi-tone higher in pitch than those of the trains, and together of course make vile discord, more and more execrable as the bridge is approached. After passing the bridge the same tones are reflected in an opposite direction, and produce equally discord, but lower, and less and less. In a tunnel, however, as is well known, the sounds are most terrible, not more discordant than those above described; but the four sets of sounds are reflected from every irregularity in the tunnel, and come to the ear in three classes of sounds, the continuous sounds of the train and the same reflected back to you, approaching, and following you as you recede. These sounds, at present rate of travelling, are all discordant. If the speed were seventy-five miles an hour, the reflected tones would be raised to a minor third, and therefore harmonise, but the tone would be melancholy; but if a velocity of 112 miles an hour were gained, then they would come to the ear increased or diminished a major third, and all the noises would be agreeable. Mr. Brunel expects soon to get a speed of 100 miles an hour on his atmospheric line; we have only to get him to reach 112, and we should go on, Mr. Russell said cheerily.

3. In a letter from M. Plucker to Faraday, transferred to our columns last month, there occurred the following passage:—"A crystal of this last salt [the red ferriferous oxide of potash] shows very clearly the

repulsion of the optical axes by the magnet; without paying attention to it, one might easily take it for a diamagnetic body, &c." This, then, was the chief point of the "new relations of the diamagnetic force" communicated by M. Plucker—namely, the repelling power of the magnet in relation to the optical axis or axes of crystalline bodies—proved by the optical axis having so much influence as to overcome the ordinary magnetic or diamagnetic power, and the repulsion being greater if the two axes be suspended vertically between the poles of the magnet than if hung horizontally. The second point was the decrease of the magnetic and diamagnetic powers by the diminution of the power of the magnet, or by increasing the distance from the poles: they do not, however, decrease according to the same law. The third point was diamagnetic polarity, which is now placed beyond a doubt.

It would be useless to attempt to convey briefly the details of the new facts obtained by M. Plucker repeating Faraday's experiments, even had we Faraday's descriptive powers, aided by the sliced potatoes which Faraday used to illustrate the subject, repeating and enlarging upon M. Plucker's statements, fearing that the real point of view had not been placed before the section, which he was anxious to make known. We, therefore, merely give as above the points of the communication, omitting as unintelligible, without such details, the discussion that ensued, and in which Sir W. Snow Harris, Sir D. Brewster, Mr. Grove, and others, took part. It turned chiefly upon the first two points, and valuable suggestions were made respectively by Sir D. Brewster and Sir W. Harris—one by the former, namely, the effect produced on a substance whose optical axes change under heat, was acknowledged thankfully by Faraday, who intends to repeat M. Plucker's experiments, and who will try whether any variations from the "new relations" can be obtained by operating upon a body with variable optical axes.

4. Further observation confirms Sir D. Brewster in considering the *foramen centrale* to be, as originally stated by Soemmering, a circle. He mentioned also a case of an eye, whose sensibility was injured, seeing the foramen as a white instead of a black spot.

5. The simple fact of the binocular effect of the stereoscope was mentioned as being equally exemplified by colour, in the case of observing a map in which the outlines of the kingdoms were coloured red and blue. Looked at near, as we understood, one colour would be raised above the other, the red nearer to, the blue farther from, the eye.

6. Mr. Stokes attributes the law experimentally discovered by Arago, by which Fresnel explained the blackness of the centre of Newton's rings, to the principle of *reversion*—the general dynamic principle, that if in any material system in which the forces depend only on the positions of the particles, the velocity of each particle be suddenly reversed, the previous motion will be repeated in the reverse direction—hence neutralization.

SECTION B.—(Chemical Science, including its application to Agriculture and the Arts.)

1. Claudet (M. A.) on the action of the red, orange, and yellow rays upon iodized and bromo-iodized silver plates, after they have been affected by daylight; and other phenomena of photography.

2. Hunt (Mr. Robert) on the influence of light in preventing chemical action.

3. Budd (Mr. J. Palmer) on the advantages made of the gaseous escape from the blast furnaces of Ystalyfera.

4. Percy (Dr., F.R.S.) on the alloys of tungsten with copper and some other metals.

5. Miller (Prof., F.R.S.) analysis of wrought iron produced by cementsation from cast iron.

6. Tennant (Mr. J.) notice of pseudomorphous crystals from volcanic districts of India.

1. M. Claudet has found that light alone can, after an exposure sufficiently prolonged, produce on iodized plate an image similar to that developed by mercury; and he recapitulates, as follows, the various means of bringing out an image on iodized plates:—

1st. By light alone, after a long exposure.

2d. By light, and by the subsequent action of red, orange, or yellow rays, as discovered by M. Gaudin.

3d. By light, and by the subsequent actions, first of red, orange, or yellow rays, and secondly of mercury, as discovered by M. Ed. Becquerel.

4th. By light and the subsequent action of mercury, as discovered by Daguerre.

The first process requires an exposure to light 500 times longer than for the process of Daguerre; the second requires a first exposure to light ten times shorter than when mercury alone brings out the image; and the third requires half that time, on account of the simultaneous action of red, orange, or yellow rays and mercury in producing the development of the image.

The action of light alone can also produce an image on bromo-iodized and chloro-iodized plates, but with this strange anomaly, that although these preparations are sixty times more sensitive to light than simply iodized plates, when the image is to be brought out by mercury, they are one-half less sensitive than the simple coating of iodine to the action of light alone, when the image is brought out without mercury. So that on the bromo-iodized or chloro-iodized plate the mercury accelerates 40,000 times the production of the photographic image, when on the simply iodized plate the acceleration is only 500 times. Respecting the subsequent action of red, orange, or yellow rays on the various coatings of iodine alone, and iodine, with bromine or chlorine, it appears that it continues the effect of white light on the simple coating of iodine, and destroys it on the bromo-iodized or chloro-iodized plate, as well as on the double coating of iodine.

It is curious to observe, that when the surface is most sensitive to light alone, the red, orange, or yellow rays have the property of continuing the photogenic effect, and that when it is less sensitive to light alone, the same rays destroy the photogenic effect; again, that when it is more sensitive to mercury, the red, orange, or yellow ray destroys the action of light, and when less sensitive it continues it.

M. Claudet has been able to ascertain that the pure light of the sun can produce on the surface of bromo-iodide of silver the change or modification by which it acquires the affinity for mercury, in the incredible short space of time which is not far from one-thousandth part of a second, and he has announced that he is contriving an apparatus to compute exactly that action, and decide many other points connected with the same subject. The researches of the author, and the results of his experiments, tend to the development of a theory for the explanation of the Daguerreotype phenomena, and his memoir on the subject will, we understand, soon be published. M. Claudet exhibited specimens illustrative of his experiments, together with some very beautiful Daguerreotype portraits, showing the high degree of perfection to which he has brought this art.

2. It appears that by passing the solar ray through certain yellow glasses and solutions, that it is deprived of its chemical power; and such light will no longer produce a photographic image. Mr. Hunt has, in a series of investigations, which are now in progress, discovered more than this. He finds that all the luminous rays protect the most sensitive compounds from chemical change. It has long been known, that the extreme red and the yellow ray produce this effect, but it has not hitherto been shown that this protecting power was more extensive. Experiments of the following class have however proved it to be so. A powerful prismatic spectrum is made to pass a yellow glass, previously to its falling upon a highly sensitive piece of photographic paper; by this it loses but little light, and the only coloured rays which suffer absorption are the extreme violet. By means of a mirror a strong light is now thrown upon the paper, or it may be exposed to diffused daylight; it is of course rapidly darkened in either case, but the space covered by the prismatic image is so completely protected from any change, that the paper is preserved perfectly white and unaltered. Mr. Hunt regards this as another proof that light and actinium are not identical, although associated elements.

3. The advantageous use made of the gaseous escape from the blast furnaces of Ystalyfera, is con-

sidered to be one of the most important practical improvements yet introduced into the iron trade, and the application of which would ultimately lead to such a radical change in the furnaces used in the smelting of iron as must alter the whole aspect and practice of metallurgical operations in this country. There was no detail of the iron trade that appeared to be a more standing reproach than the non-utilization of the enormous escape of combustible and incombustible gases, heated to a very high temperature, that is constantly taking place from the tops of blast furnaces. Some of these enormous crucibles yielded 150 tons, and even in Scotland 200 tons of iron a week—devoured weekly from 300 to 400 tons of coal, and inspired 4000 to 5000 feet of air as blast per minute. These great craters vomited forth murky volumes of smoke and flame, which passed wastefully away to contaminate the atmosphere. Various attempts have been made to apply this waste directly to heating purposes, and indirectly by burning the gases, but without success, owing, in the first class of processes, to the operations of the furnace having to be suspended in case of derangement in the apparatus. Mr. Budd laboured under considerable difficulty, from the circumstance of his using anthracite coal, which could not be made to drive like coke, but in his attempts to use the escape from the tunnel head, he neither made the apparatus part of the furnace, nor attempted to burn the gases. The stove was built alongside the furnace, and by means of a stack about twenty-five feet higher than the top of the furnace, he drew into it as much of the heated air and flame as he required. From its simplicity this plan was eminently successful—his apparatus being merely three or four horizontal tubes of about twelve inches diameter, constructed about three feet below the top of the furnace, and leading into an adjoining chamber or stove, provided with a stack which caused the draft. Into this stove he was enabled to draw as much of the gaseous escape as he required, or, by means of a damper on the stack, as little as he chose. The quantity required to produce hot blast is not more than about one-sixth of the quantity passing off the tunnel head. He could warrantably boast that his plan was as simple as a boiler to supply hot water at the back of a kitchen grate. Mr. Budd then directed attention to an ingeniously constructed model of the furnace and apparatus, consisting of the horizontal flues from the furnace to the stove, the stove or heating chamber, the stack which created the draft and drew the gases through the horizontal flues, the damper on the stack, the forty-eight upright heating pipes through which the blast of air passed, the cross-pipes on which the uprights are fixed, the side-pipes conveying the blast to the cross-pipes, the upcast pipes conveying the cold air to the stove, the downcast pipes conveying the heated air from the stove to the tunnel, the front door by opening which and closing the damper the draught is reversed, and a current of cold air introduced through the stove by which it may be cooled down in a few hours so as to admit of men entering it. Mr. Budd then enumerated the advantages arising from the application of this process over all others hitherto tried, one of which was the much greater durability of the apparatus—that erected by him nearly four years since being now as good as new. He then proceeded to review the probable objections to these applications by practical men, the whole of which he deemed to be untenable; and concluded by expressing a hope that this important subject would attract the attention of those engaged in the iron trade. The saving to him was 547L a year per furnace, which on ten furnaces (the full extent of the works) would be 5470L a year.

The works of Ystalyfera, where Mr. Budd's process is thus successfully and economically in operation, formed the attraction, as we have already mentioned, of the largest party of excursionists on Saturday. The paper was again read and the model explained in Section G, on Monday, when Mr. Scott Russell described it as one of the subjects of congratulation to members for visiting Swansea. It is seldom, he said, that we get a practical man to come forward; but when we obtain views and facts of experience from a

sound practical man, he considered the British Association to have performed one of its most important objects. As a practical man himself, he considered Mr. Budd's process soundest in theory, and simply and economically carried out. Unless a new system had been followed, the same want of success as characterized former attempts would have ensued; but in this were exhibited judgment, safety, and success. Mr. Budd had kept his additional apparatus additional, and not made it an integral part of the furnace; and even if failure had occurred it would have been only in the additional apparatus, without derangement of the smelting process. He remarked upon several points of advantage, considered the process as likely to give rise to a long series of improvements, and again mentioned the communication as an illustration of the excellence of local meetings—getting up fragments of knowledge in districts, and adding them to the common stock of information. The paper will be inserted at length in the British Association volume for 1848.

4. Dr. Percy recorded an unsuccessful series of experiments to alloy brass, copper, &c., with tungsten, which he had undertaken in the hope of adding tungsten to the resources of industrial art.

6. Mr. Tennant exhibited some fine specimens of pseudomorphous crystals.

SECTION C.—(*Geology and Physical Geography.*)

1. De la Beche (*Sir H. T. C.B.*), on the geology of portions of South Wales, Gloucestershire, and Somersetshire.

2. Benson (*Mr. S.*), on the relative position of the various qualities of coal in the South Wales coal field.

3. Benson (*Mr. S.*), on a boulder of cannel coal found in a vein of common bituminous coal.

4. Bate (*Mr. C. Spence*), on fossil remains recently discovered in Bacon Hole, Gower; also some from beneath the bed of the River Tawe.

1. Sir H. de la Beche looking upon the section as an assemblage of two parties—those who were perfectly conversant with the subject under consideration, and those to whom it was new, and who required information of an elementary character, and evidently giving a great majority to the latter class—delivered a long lecture on geological phenomena, illustrated by the local peculiarities with which he considered his hearers best acquainted.

He occupied nearly three hours in explaining circumstantially the formations in the districts to which his observations referred. He traced them to various causes, the operation of forces, deposition, chemistry, and the frequent destruction and reconstruction of organic remains. He described the ancient Silurian, so often treated of in our pages; the series of old red sandstone, and its positions towards the Silurian; the carboniferous limestone with its abundance of organic remains, and varying from 2000 to 70 or 80 feet in thickness. The coal measures were next discussed, and the singular phenomena of the cracks or faults which occur in them pointed out and illustrated. A great crash, he held, had taken place after the formation of the coal; and the whole series of existing rocks crushed together in Great Britain and many parts of Europe. He finally laid down a theory of the land having been 1500 feet lower than now, and consequently beneath the waters of the sea; that glaciers and icebergs beset the coasts of North Wales, as shown by deposits of arctic shells; and that the land had again risen above the sea higher than now, and been again depressed, as was shown by submarine forests along the northern coasts, and trunks of oak and alder to be seen in Swansea Bay, 20 or 30 feet beneath the level on which they had grown.

Mr. Greenough objected strongly to the generalizations so readily adopted by his geological brethren, and called upon them to define what land and sea was before they ventured on such hypotheses.

2. Mr. Benson's first paper was of much local interest. It described the transition of the three kinds of coal in the field into each other—1st, of the bituminous into the free burning; and 2ndly, of the free burning into the anthracite, the free burning lying between the two.

Mr. Benson's papers contained interesting local information, which however, especially the first, re-

quires a coloured map accurately to convey. The varieties of coal found in the mineral basin of South Wales, may be classed as—

1. The bituminous—the small of which will coke.
2. The free-burning—the small of which will not coke, but which burns with great rapidity, and a considerable volume of flame.

3. The anthracite, or stone coal.

But these three principal characters of the coals of South Wales are not distinctly marked in their extent or limits; as in the same vein of coal there is often a gradual change from the bituminous to the free-burning, so between the free-burning and stone coal on the north side of the basin is a considerable extent of culms, which losing the free-burning quality of emitting flame, are still without the value and the proportions of carbon of the true stone coal.

On a general estimate the coal field between PontyPOOL on the east, and Kidwelly, where both crops merge in the sea, would form an area of 750 square miles, of which the proportions would appear to be coking coal, smelting coal, and free coal, 11-15; culm, 2-15; stone coal, 2-15; exclusive of the Pembrokeshire portion of the coal field.

Assuming a central line of quality from Merthyr to Pembrey mountain, near Llanelli, to rise with a slight curve almost conformably to that of the southern side of the coal field, the southern veins of coal gradually lose their quality of coking in coke ovens until they become free-burning in the centre, whilst on the north of this line the free-burning coal gradually become anthracite culms, and stone coal on the north crop. The lines of demarcation would appear to run south-west to north-east, with, however, certain exceptions, and of these the most singular probably is the coal lying between Drumma and Marc Howell mountains, where a small district of strong but still coking coal is found on the north crop at Kilybebil. It, however, in all probability, now occupies an elevation far lower than its original relative position to the veins beyond the faults east and west of it, as the Marc Howell and Drumma mountains, if correctly supposed to be Pennant, belong to a far lower series of rocks than those in which the Kilybebil coal lies.

Another peculiar exception is a small patch of coal, called goitre, south of the bituminous veins of Cwmavon, which is generally considered a free-burning coal. It lies on the top of the antecedent line, and is consequently nearly flat. But upon trial the quality of this coal is found to be more clinkery, and very dissimilar to free-burning coal, and the difference in its quality from what its position in the coal field would indicate, probably arises from some local cause, arising from an inferiority originally in the composition of the vein of coal.

The principal object of the paper (2) had reference to the cause of the formation of the variety of coals in the South Wales basin, and had been drawn up in the hope of aiding or leading to the true solution of the cause.

About ten years since, (3) Mr. Logan noticed the frequent coal and iron-stone conglomerates occurring in the sandstones of the Town Hill, near Swansea. Mr. Benson's attention was first awakened to the subject from the discovery of an undoubted boulder of cannel coal above the seam of common bituminous coal, called the Five-foot Rock Vein, at Pencawd. The series of coal measures included in the Pennant rocks are easily traceable throughout the South Wales coal-field, from the greater hardness of their sandstone, and their elevation as a nearly continuous range of hills. It would appear that whilst the sandstones and slabs of the coal-measures below the Pennant rocks have been deposited or formed in comparatively quiet water, the sandstones of the Pennant series contain frequent conglomerates of coal and iron-stone, drifted plants, and occasionally small boulders of granite, with other proofs of drift to a considerable extent having occurred during the period of their formation. Bivalve shells are also found in considerable masses in the shales below the Pennant group, both on the north and south outcrop, evidently showing that they now repose, unmoved from their

original beds, whilst the only shells I have yet seen on the Pennant were a short distance from the Penclawdd seam, which is one of the lowest in that series. During the present year, another boulder of cannel coal was discovered in the Penclawdd seam, which the workman who found it positively affirms to have been in the vein of bituminous coal. The boulder is thirteen inches long, seven wide, and three thick, one corner having been broken off after it had become rounded by attrition, probably a short time prior to its arrival at the spot in which it was found: a siliceous cement has coated a part of the surface of this fracture, has filled the cavity caused by another fracture, and also attaches a piece of rock to the boulder. The Penclawdd five-foot vein is about 300 yards in geological position below the quarries of the Townhill sandstone, and throughout this depth there would appear to be frequent instances of drift and false beds of coal; in some specimens, the pebbles of the older or drift coal having, from their greater hardness, penetrated into and distorted the drift plants, which have since become coated with the newer coal. One or two other pieces of cannel coal have been found at Penclawdd, but as these were discovered in the heap of bituminous coal, after it had been raised to the surface, and from exposure to the air, had heated and slackened, they may have originally formed parts of large boulders, and their present angular form is no certain proof of their having been derived from other beds in the immediate locality.

In the subjacent measures of the South Wales coal-field, some seams associated with regular seams of cannel coal are known to exist, about 700 yards below the Penclawdd vein, and lying conformably with it. In alluding to the boulder he discovered, Mr. Logan remarks:—"To suppose that the boulder is derived from the lower seams, after they have been indurated, converted, and crystallized, would, it is apprehended, be carrying the age of the whole deposit to an extent that has never yet been conceived, and is perhaps inadmissible, for it is not easy to account for any mode in which a fragment of them without a disturbance of the stratification, which yet exhibits none of a requisite order, could be displaced and conveyed to the newer beds whilst forming. It is therefore safer to refer the boulder to some anterior deposit of coal, perhaps no longer in existence. To attempt to determine whether these boulders of cannel coal are derived from the lower measures or from some anterior deposit, I have not been able to collect sufficient data, but some pieces of the topstone of the Penclawdd vein, may be interesting, as they show that conglomerate of small pebbles of iron-stone, apparently identical in quality with the large deposits of iron-stone of the lower measures, has been deposited within a few inches of the top of the Penclawdd vein of coal. If the boulders have been derived from the lower veins of the series they may probably have been supplied from some partial destruction of the lower measures at the south-west corner of the basin, previous to the formation of the veins included in the Pennant series of sandstones. It may have occurred that, during the gradual subsidence of the land beneath the estuary or basin in which the successive strata of coal, sand, and shale have been deposited, communications between such basin and the larger sea have been formed or enlarged, and that the detritus of the lower measures, thus exposed to the action of the sea, has from time to time supplied the boulders and drift during the formation of the Pennant series. The greater coarseness of the Pennant sandstones, and the frequent conglomerates and marks of drift, infer that these deposits have occurred frequently under the action of the rough sea rather than of the quiet lake, and if the boulders of granite should, upon examination, be found to be equivalent to that of Pembrokeshire, it would rather point to the line of drift. The destruction of a portion of the lower beds before the deposit of the higher, might, as I have ventured to suggest, have been effected without disturbing the conformity of the lower and Pennant measures on the existing portions of the coal-field."

The question whether a large portion of the coal-

measures has or has not been cut off by the anticlinal line of Cefn Bryn, would not affect the suggestion; as this up-heaving of the old red sandstones equally distorts the higher and lower measures, and probably occurred when the present coal-field was again raised above the level of the waters.

But if the suggestion is admitted as deserving of further inquiry — namely, that these boulders are derived from the lower veins of the same coal-field, the inference (and a question of considerable interest it is) would follow, that sufficient time has elapsed between the deposit of each vein to allow the perfect crystallization and formation of the vein below it. It also yields information interesting with reference to the ascertaining of the manner of the formation of the coal; as it would infer, that the material of which, in this instance, the bituminous vein was formed, was originally too soft and yielding, notwithstanding its present hardness and density, to fracture the boulder during the period of pressure necessary for its formation, and also, that the chemical agents acting, or escaping, during the formation of the bituminous coal, do not appear to have in any way affected the cannel coal deposited within it.

Mr. Booker, at the request of Sir Henry de la Beche, gave the statistics of the mineral basin of South Wales, and also read copious extracts from a paper which was written 250 years ago by a Welshman, named George Owen, who was Lord of Cemmes, in Pembrokeshire. The conclusions arrived at by this writer, and the description given by him of the course of the minerals, with the various geological sections, formed a strong confirmation of the views taken by eminent geologists in the present day. Mr. Benson had in his paper taken the gross area of the South Wales basin of minerals at 750 square miles. A few years ago, Mr. Martin had stated that the contents of each square mile might be estimated at 64,000,000 tons of coal for exhaustion; and taking the gross area at 100 square miles, they would have for the purposes of life the amount of sixty-four hundred millions of tons. But if they multiplied that amount by $\frac{7}{8}$ — to arrive at the estimated quantity contained in 750 square miles — the whole amount available for exhaustion would be great indeed. Mr. Booker then referred to the rate at which coal was used in the present day. Sir John Guest used 1400 tons of coal per day, which, being multiplied by 300 working days, gave 420,000 tons as the quantity used by him in a year. There were already within the confines of this mineral basin 150 blast furnaces for smelting iron; those furnaces produced 550,000 tons of iron a year; the coal consumed in smelting that quantity of iron amounted to 1,500,000 tons; the copper works consumed about 200,000 tons, and the tin works about 150,000 tons; the shipments from different ports were — from Newport, 600,000 tons; from Cardiff, 550,000 tons; from Neath and Swansea, upwards of 500,000 tons; and from Llanelli, 100,000 tons; agricultural and domestic purposes consumed 750,000 tons, — the whole forming an exhausting process of about 4,350,000 tons per year. If, then, they took the area of coal available for exhaustion at only 100 square miles, and estimated the amount to be obtained at only the trifling quantity of 64 hundred millions of tons, the supply would meet the demand at the present rate of consumption for 1400 years to come.

SECTION D.—(Zoology and Botany.)

Zoology.

1. Owen (Prof.) on the development and change of the teeth in the kangaroos; and on the homologies and notation of the teeth in mammals.

2. Owen (Prof.) on the Eustachian tubes in the crocodiles.

3. Williams (Dr. Thomas) on the structure and functions of branchial organs of the annelide and crustacea.

Botany.

4. Moggridge (Mr. M.) on peculiarity in protococcus nivalis.

5. Lankester (Dr. E., F.R.S.) on vegetable monstrosities.

6. Henfrey (Mr. A.), note on the development of pollen.

Professor Owen's paper was reported in full in our last week's number.

No. 3 is an instance of local science, which we have pleasure in giving at some length, and to acknowledge a debt to the local press. Dr. Williams

remarked that he had submitted the ciliary variety of epithelium, in nearly all classes of invertebrate animals, to careful microscopic examination, with a view to determine the variation of structure, conformation, and size, which these minute elements of organization undergo in the lowest grades of the zoological scale, and that he had arrived at the following conclusions:—

1st. That ciliary epithelium is not universally present on the breathing organs of invertebrate animals.

2nd. That, as far as his researches into this subject have extended, no anatomical conditions can be accurately defined as co-existent with, and indicative of, the presence of ciliated epithelium on the branchial organs.

3rd. That the principle is invariably observed, except only on those examples in which the respiratory organs are not expressly localized, of reducing, in every practicable manner, the thickness of all structures, and, therefore, that of the stratum of epithelium intervening between the external air and the circulating fluids; and that this principle necessarily involves the flattening of the true branchial and pulmonary epithelial cells.

4th. That comparative anatomy establishes the fact, that in invertebrate animals the figure of the nucleated cells is not distinctive of the several structures of the organism, and that the oval form of cell, which is the predominant variety in molluscous animals, is the product merely of mechanical forces acting from the interior, and caused by the accumulation of the fluid contents, and is significant of an inferior degree of formative power; and that the prismatic order of cells, common on the mucous structures of vertebrate animals, by the preservation of their own peculiar figure, are denotive of a higher grade of organizing energy.

5th. That in consequence of the immediate agency of atmospheric oxygen upon the contents of superficial epithelia, under which class the ciliated order was of course comprehended, no oily and adipose constituents could accumulate in the chamber of the cell; and that with reference to the vibratile epithelium, the glandular character of the cell, as indicated by the presence of molecules and oily particles, was sacrificed to the development of its motive appendages.

6th. That since the internal surface of the lungs of air-breathing vertebrates are lined by a layer of mucus more or less dense, the oxygen of the air in passing into the blood is fluidified by solution in the mucus; or if the idea of gaseous liquefaction be disallowed, dissolved before the penetration of the vascular parietes, it follows in every essential respect that a pulmonated air-breathing animal presents no exception to the general physical laws which govern the process of aquatic respiration.

7th. That the presence of ciliary vibration, as proved by recent observation on the lungs of batrachian, ophidian, chelonian, and saurian reptiles, being air-breathing animals, establishes the importance and probable necessity of motive epithelium as an element of structure in the respiratory organs of all vertebrate animals, and that analogy strongly supports the belief that in the lungs of birds and mammalia ciliary vibration will be eventually discovered.

8th. That while the general conformation, disposition, and magnitude of glandular organs acquire complexity proportionately to the elevation of the animal in the series, the ultimate elements of structure, such as nucleated cells, present equal perfection in the lowest and highest members of the zoological scale — unless the oval figure, as formerly observed, be acknowledged as a mark of inferiority.

The author then proceeded to a minute account of the vascular system of the respiratory organs in the annelide and crustacea. The blood system of the

branchiae in the annelides were reducible to three leading systems—those, firstly, typified by the *Arenicola*, *Serpula*, and *Terebellis*, in which the vessels projected out from the cephalic or lateral portions of the body to a distance more or less considerable, the branchial filaments or threads presenting various subdivisions. In these organs, Dr. Williams maintained that, contrary to the description of all systematic writers, the blood-vessels consisted of an afferent and efferent channel, in which the blood respectively flowed and returned, and that it did not consist of a single conduit, in which a flux and reflux of the fluid had been supposed to occur. In the nextie, exemplifying the second type, the vessels were subdivided into a system of parallel capillaries, which enclosed after the manner of a framework the branchial mammillary protuberances; and that in the third, illustrated by the scutellar or branchiata annelides, the respiratory sacculi were furnished with a system of retiform capillaries, distinguishing anatomically these species of annelides from all others. Of the crustacea, the author grouped the respiratory organs under the two principal divisions of internal and external, which respectively again were distributed under a lamellar and tubular order. The dense, corneous integument of the crustacea was described as in all species, constituting an inelastic investment to the true blood channels, and intervening between the circulating fluid and the surrounding medium.

The paper was illustrated by numerous diagrams, and called forth remarks from Professor Owen, Dr. Carpenter, Mr. Bowerbank, and Professor E. Forbes. All concurred in the hope that Dr. Williams would continue his researches, and the structure of the annelides was pointed out as an important and promising field. Dr. Carpenter differed, in one or two minor points, from Dr. Williams' conclusions.

5. Dr. Lankester, after drawing attention to the fact that all the parts are modifications either of the stem or leaves, exhibited specimens and drawings of several plants confirmatory of this fact: 1. A case of the common furze, in which the spinous leaves were converted into broad expanded leaves. 2. Specimens of two species of plantain, in which the bracts at the base of the flowers were converted into leaves. 3. Specimens of the common radish, in which the stamens, petals, and sepals, were converted into leaves. 4. A specimen of common goat's beard, in which the papus, florets, and style were converted into leaves. 5. The capsule of a poppy, from the interior of which projected four leaves partly converted into a capsule. 6. Gooseberries, in which the fruit bore upon its surface small bracts or leaves. Dr. Lankester believed that the production of this tendency, on the part of the more highly developed parts on the axis of the plant, to its lower forms, depended on over nutrition, or the attacks of insects. In cases of under nutrition there was a tendency to develop the stem or formless masses of tissue, as seen in various forms of vegetable excrements.

SECTION F.—(Statistics.)

1. Fletcher (Joseph, Esq., Barrister-at-Law), statistics of Brittany and the Bretons.
2. Sykes (Colonel, V.P.R.S.), statistics of the legal affairs of the government of Bengal.
3. Powell (Prof.), contributions to academical statistics.

1. Mr. Fletcher's communication was an abstract of the report of a tour in the five departments of Brittany during the years 1840 and 1841, under instructions from the Academy of the Moral and Political Sciences, made by MM. Benivien de Chateauneuf and Villermi, members of that Academy, and continued in the fourth volume of the *Memoirs of the Academy of the Moral and Political Sciences*. It described the surface of the great peninsula of Brittany, projecting into the ocean between the Bay of Biscay and the English Channel, to comprise 1715 square leagues,—the French league of length being $\frac{1}{2}$ English miles, or 3,388,850 hectares of $\frac{1}{2}$ English acres. Its central parts are occupied in great measure by a double range of mountains, of no great elevation. In speaking of Breton cultivation, it is necessary carefully to distinguish between that of the borders and that of the interior of the country.

In the former it is intelligent, advanced, and productive; in the latter it is ignorant, prejudiced, and unproductive. In the two entire departments of Finistère and Morbihan, there are more heaths than cultivable land; and it is, of course, in these wilder regions, with those of the department of Côtes-du-Nord, that the old manners, habits, and customs of the country are most tenaciously retained. The valleys in these remoter regions are so filled with the banks and high leafy hedgerows that divide the petty farms and properties, that one may travel through the midst of a numerous people without perceiving their habitations; and the population dispersed upon the land is, in fact, much greater, even in the most barren regions, than in France generally. The sources of the reputed poverty and backwardness of the province being the especial object of the inquiry, every available statistical evidence was collected for the whole province and each of its departments; but the especial attention of our travellers, it is obvious, was given to the poorest and most backward departments, to which alone much of their details, into which we cannot enter, apply in their full force.

The Breton sows for the first year buckwheat, which is his own principal food; the second, wheat; the third, barley or oats, or often wheat again, of which he thus takes two crops in succession; and then he leaves it bare, except of self-sown weeds, for three, four, and five years, and often much longer; replying to every argument in favour of garden crops, with all the firmness of conviction, that the land requires rest as much as the arms that cultivate it. Thus the want of manures diminishes the produce; the want of produce permits him to keep only a few animals on so little forage; few animals again yield little manure; and little manure gives little produce;—a deplorable circle, in which the Breton is completely bound up by ignorance and routine, and so many more in France with him. His implements are as antiquated as his methods—a class possessed of large properties, and making a proper use of adequate resources, is then shown to be essential to any further considerable improvement; and yet that the peculiar Breton custom of tenant-right to compensation for improvements has not proved a panacea for a distress frequently as great as that of Ireland.

The cattle are very poor and inferior—an ox weighing from 50 to 260 kilogrammes, of $\frac{1}{2}$ English pounds; a cow, from 40 to 100 kil.; sheep, from 10 to 18 kil. The quantity of cattle on the land has greatly declined since 1812. From 10,000 to 15,000 horses are sent annually out of the country, for the service of the artillery, cavalry, &c.

The commercial industry of Brittany is almost wholly in agricultural produce (of which it exports all the best), in grain, hemp, flax, cattle, and horses; and less important articles, such as honey, beeswax, and butter. Salt from the neighbourhood of Nantes—oysters from the Bay of Cancale—and pilchards from the Bays of Douarnenez and Concarneau, are exported in considerable quantities.

A certain number of ships are annually equipped to the shores and banks of Newfoundland; and there is a considerable manufacture of the flax and hemp grown within the province; but an obstinate adherence to old instruments and methods, and a positive rejection of better, has gradually reduced both spinners and weavers to the most abject misery, in competition with the improved processes and growing combinations of capital in the world around them.

The population of Brittany, in 1800, was 2,302,700; in 1831, 2,574,000; in 1836, 2,620,300; in 1841, 2,666,200. The increase, from 1800 to 1835 inclusive, was 30 per cent. in Loire Inférieure; 23 in Finistère; 22 in Ille-et-Vilaine; 20 in Côtes-du-Nord, and only 12 in Morbihan—the average, in all Brittany, being 19 per cent. In France generally, it has been 22; while the increase in England and Wales is more than double even the latter rate. Notwithstanding this slow increase of population in Brittany, its actual amount, in even the most waste and uncultivated departments, is greater, in proportion to the total surface, than in France generally;

including its most fertile provinces—the average, in all France, being 1,256 inhabitants per square league, while in Morbihan it is 1,270; Loire Inférieure, 1,364; Ille-et-Vilaine, 1,618; Finistère, 1,623; Côtes-du-Nord, 1,781, and all Brittany, 1,598. Two-thirds of this population is dispersed over the surface of the country on small properties, small tenancies, and cottage holdings—the proportion of town population being small, as compared with France generally. Out of 40,000 houses in the whole department, 40,000 have only two or three openings, being one or two besides the door.

Movement of the Population in Brittany and in all France, 1831 to 1836:

	Brittany	France
Mean population	2507,230	33,055,000
One birth to	30,68	33,90
One death to	33,68	38,60
One marriage to	130,00	127,00
Births to each marriage	4,19	3,57
One illegitimate Birth,	80,12	18,81

The maximum of births, deaths, and marriages to the population falls in Finistère; and the maximum of children to each marriage in Morbihan (4,51). The average age of the first marriage of the men is twenty-eight years and four months, and of the women twenty-five years and eleven months. In England and Wales, the average of marriage in both sexes, even including second with first marriages in the same average, is decidedly less, being twenty-seven years and three months for the men, and twenty-five years and three months for the women.

In the army and navy the Bretons are found hardy and obedient, for out of every 1000 recruits, only 375, instead of 607, (the average of all France,) have had exemptions on account of ill health; and only 72, instead of 104, to each department, from being refractory to the conscription.

The total produce of the state taxes levied in Brittany, exclusive of the local taxes, was 70,825,700 francs, which gives for its population at that time an average of about 26½ francs, or 11. 1s. per head, which for a population so unprosperous is a very heavy amount. The exceeding misery of the Breton peasant was noticed by Neckar, in 1784; again by Arthur Young, ten years later, and, relatively to that of the population of the rest of France or of Great Britain, it is as conspicuous as ever. The interior of a Breton cabin in its worst departments is described as a parallel to that of an Irish one, buckwheat bread being the chief sustenance instead of potatoes. The more prosperous cultivator beside him, if Heaven grant abundance to his fields—that is, abundance of buckwheat, on which he lives, and of the apples from which he makes his favourite drink, is as content as the other with his lot, though humble enough; for flesh meat once or twice a-week, articles of furniture a little less broken, woollen instead of linen clothing, shoes instead of sabots, form the only difference between them. The peculiarity of his language appears to be the greatest obstacle to the social advancement of the Breton, and the isolation in which it keeps him perpetuates his ignorance. The bairns and good sisters are still, to a great extent, as they were formerly, the sole instructors of the people. Under the republic, there were scarcely fifteen elementary schools in all the department; and little advancement was made until within these few years, under the competition of the government schools with those of the "Frères de la Doctrine" and the disciples of Lamennais, called the "Petit Frères." M. Guerry reckons only 1 in 90 of the inhabitants to be under instruction; and in the five years, 1836—40, 78 per cent. of those arraigned before the criminal courts could neither read nor write: four of the five departments of Brittany being included among the six in all France in which four-fifths and more of the accused show this degree of ignorance. Notwithstanding the Breton's fondness for drink, he is very saving; he is passionately fond of dancing too, and yet his movements and his music are equally without grace. With a wretched agriculture;

manufacture, or trade, the soil in such energy sufficient to new experiments, one which is education, the means of

2. Between the Bretons and the latter, reflecting the liberality towards the

3. Professors during the students enter

4. Dennis circle.

1. Whitchurch various applications
2. Whitchurch telegraph
3. Russell movement of steam
4. Dennis circle.

1. 2. Mr. on the history resting to numerous constables' shields. Of the apparatus especially of electrical circuit. Literary Gears, now monthly, perha, in it distinct marks sulphur—n—perha; 2, constitution Monday, when Cambridge guitars perhaps. Various experiments can be done upon the roots of orange and orange.

The "Times" perha, threaved, and quarters of blowing at other. In superseding doubtless, in graphs, it is most speed person to three-quarters having been the Queen's conveyance.

3. Mr. 1836 was in the boiler steam vessel form and with great steam—those go what was the Holy Ghost these principles but the greatest examples of which the early period.

4. Mr. I the are to be castin

manufactures which reject all improvements of process or machinery, and a people in penury hugging the soil in small patches, with no class of wealth and energy sufficiently numerous to lead the population to new exertions, the problem of their elevation is one which it is indeed difficult to solve. General education, and special education in husbandry, are the means most strongly urged by the reporters.

2. Colonel Sykes, after making a comparison between the Bretons and the Welsh, highly favourable to the latter, read his paper on Bengal, which illustrated the liberality and justice of the British Government towards the Hindoo population.

3. Professor Powell produced the statistics of Oxford during the last eight years, the annual numbers of students entered, and the results of their graduating.

SECTION G.—(Mechanics.)

1. Whishaw (Mr. F.), exhibition and explanation of the various applications of gutta percha.

2. Whishaw (Mr. F.), on the "Telakouphonon," or speaking telegraph.

3. Russell (Mr. J. Scott), on recent steps in the improvement of steam navigation.

4. Dennis (Mr. J. C.), on improvements in the reflecting circle.

1. 2. Mr. Whishaw's communication was a lecture on the history and manufacture of gutta percha, interesting to a general audience, and illustrated by numerous specimens—thread, cord, pipes, bands, constables' staves, sticks, whips, inkstands, medallions, shields, water-buckets, stereotype plates, &c. &c. Of the applications of this valuable material, but especially of the utility found in it by Faraday for electrical purposes, we informed our readers in *Literary Gazette*, No. 1624. The company, it appears, now regularly import from twenty to sixty tons yearly. Their chemist, Mr. Crane, finds gutta percha, in its ordinary state, to consist of at least two distinct materials, besides an appreciable quantity of sulphur—namely, 1, a white matter, pure gutta percha; 2, a dark brown substance. This view of its constitution was communicated to Section B on Monday, when Mr. Solly stated that his analysis (see *Cambridge Transactions*) identified in most respects gutta percha with caoutchouc, but detected no sulphur. Various experiments showed that the only pigments that can be relied on to be used with gutta percha are rose pink, red lead, Dutch pink, yellow ochre, and orange chrome.

The "Telakouphonon" is a speaking tube of gutta percha, through which almost a whisper can be conveyed, and of course a conversation kept up, three-quarters of a mile off, attention being first drawn by blowing at the one end, sounding a whistle at the other. In manufactures, and indeed in private houses, superseding the use of bells, the telakouphon will, doubtless, be tried; and were there no electric telegraphs, it might be employed to convey intelligence most speedily to any distance, requiring however a person to be stationed at the end of each tube of three-quarters of a mile or a mile in length. A flute having been inserted in one end of a tube, "God save the Queen" was played at a distance of 100 feet from the person blowing the flute. Mr. Whishaw also exhibited the gutta percha sub-marine rope for the conveyance of telegraphic wire.

3. Mr. Russell's, like Mr. Whishaw's, communication was an interesting lecture on the improvements in the boilers, engines, paddle-wheels, and forms of steam vessels. In regard to the latter, the wave form and wave principle are now adopted by all the great steam ship-builders, and all the fast steam-boats—those going fifteen to seventeen miles an hour—had what was called the wave-bow. Of the eight boats on the Holyhead and Dublin station, all were built on these principles, modified, however slightly, in some, but wherever the departure from the principles was the greater, the speed was slower. Still all were examples of the value of the form and the principles which the British Association had introduced at an early period of its history and advocated, and at the success of which Mr. Scott Russell may justly be proud.

4. Mr. Dennis suggested that, instead of attaching the parts to the parts which support it, the whole should be cast in one piece, and afterwards polished and divided.

LITERARY AND LEARNED.

BRITISH ARCHAEOLOGICAL ASSOCIATION.

WORCESTER CONGRESS.

ONE of the most interesting papers read at this meeting was on the first evening by Mr. Wright, "On the Romantic Materials of History," illustrated from the autobiography of Egwin, Bishop of Worcester; and was as follows:—

When we commonly quote history, it is the popular opinion—we may say the popular prejudice—that history is truth. Yet we no sooner subject this same history to the strict test of criticism, than we discover that it is nothing better than a confused heap of statements without foundation or resting on ambiguous traditions, of intentional falsehoods or misrepresentations originating only in the bitterness of political animosities, and, lastly, of mere fable and romance. Few, who have not examined deeply into the sources of history, would imagine how much of this last-mentioned class of materials enters into its composition. When we compare the histories of different countries, in ancient as well as in modern times, we are surprised at the frequency with which the same event occurs in them all—battles gained by the same stratagem or lost by the same disastrous accident—the same details of crimes and of virtues—the same fates of individuals. The incident of Alfred harping in the Danish camp is thus repeated in English history within half a century in that of the Dane entering the Saxon camp at Brunburgh in the same disguise. The story of William Tell shooting the apple from the head of his son is found under other names in the old ballad poetry of England and Germany.

This remarkable relationship between the historic stories of different peoples admits of a very simple explanation. A vast mass of popular fables—much of it of a mythic character—and romances floated, during the middle ages, from country to country, and from mouth to mouth, and these, frequently taking a colouring from place and circumstance, became located, and, being fixed upon individuals, were handed down to us as historical facts. You will understand my meaning best by an example.

Many of the popular stories of the middle ages were collected and entered, without much order, into manuscripts in Latin or in French—others were set in verse by the minstrels, to be recited in the baronial hall, and as street ballads were sung about the country—and many were presented to us in other forms. Among the Latin stories, the following is found in a manuscript of the thirteenth century. A wealthy English baron, who had extensive possessions in England and Wales, had three sons; when lying on his death-bed he called them to him, and said—"My sons, if you were compelled to become birds, tell me what bird each of you would choose to resemble?"

The eldest said, "I would be a hawk, because it is a noble bird, and lives by rapine."

The second said, "I would be a starling, because it is a social bird, and flies in coves."

The youngest said, "And I would be a swan, because it has a long neck, so that if I had anything in my heart to say, I should have plenty of time for reflection before it came to my mouth."

When the father had heard them, he said to the first, "Thou, my son, as I perceive, desirest to live by rapine: I give thee my possessions in England, because it is a land of peace and justice, and thou canst not rob in it with impunity."

To the second he said, "Because thou lovest society, to thee I give my possessions in Wales, which is a land of discord and war, in order that thy courtesy may soften down the malice of the natives."

And to the younger, "To thee I give no land at all, because thou art wise, and wilt gain enough by thine own wisdom."

And as he foretold, the youngest son profited by his wisdom, and became Chief Justice of England, which, in those times, was the next dignity to that of king. We are given to understand that the two others, by their respective violence and liberality, reduced their fortunes.

This was a common popular story, probably of great antiquity, and found in many different countries.

I think I have met with it in an Eastern form. Having heard this, you will at once understand the origin of the following anecdote relating to King William the Conqueror, which is told gravely by a chronicler of the beginning of the fourteenth century.

The monarch I have just mentioned was one day pensive and thoughtful; his wise men inquired the cause; upon which he stated that he was desirous of knowing what would be the fate of his sons after his death. The wise men consulted together, and at length it was proposed that they should put a certain question separately to the three princes, who were then young. The first who entered the room was Robert, afterwards known by the surname of Courtoise. "Fair sir," said one of the wise men, "answer me a question: If God had made you a bird, what bird would you wish to have been?" Robert replied, "A hawk, because it resembles most a courteous and valiant knight." William Rufus next entered, and his answer to the same question was, "I would be an eagle, because it is a strong and powerful bird, and feared by all other birds, and therefore it is king over them all." Lastly came the younger brother, Henry, who had received a learned education, and was on that account known by the surname of Beauclerc; he said, in reply to the question of the wise men, "I would be a starling, because it is a debonnaire and simple bird, and gains its living without injury to any one, and never seeks to rob or grieve its neighbour." The wise men returned immediately to the king. Robert, they said, would be bold and valiant, and would gain renown and honour, but he would finally be overcome by violence, and die in a prison; William would be powerful and strong as the eagle, but feared and hated for his cruelty and violence, until he ended a wicked life by a bad death; but Henry would be wise, prudent, and a lover of peace, except when compelled to war—he would win wide lands, and die in tranquillity. When King William lay on his death-bed he remembered the saying of his wise men, and bequeathed Normandy to Robert, England to William, and his own treasures, without land, to his youngest son Henry, who eventually became king of both countries, and ruled them long and prosperously.

The history of these three princes offers a sufficient conformity to the character given them in the story, and the common historian would see no reason for doubting of its truth; and should he find, which is likely enough, the same anecdote related of an Arabian or Indian monarch, he would be naturally enough astonished at the coincidence, and unable to account for it. But our knowledge of the general existence of the stories on which such incidents are founded in all countries, and of their conformity with one another, supplies us with a canon of criticism of the greatest importance, if we would really study history in an intelligent manner.

When we met together last year at Warwick, I had an opportunity of pointing out the manner in which the great cycles of the medieval romances became continually embodied in what was afterwards looked upon as sober history. The popular literature to which these romances and fables belonged had a more powerful hold upon men's minds, because they were founded upon and derived directly from the ancient mythology of the whole Teutonic race, and it is to the original unity of this mythology that we owe the striking similarity we observe between the romance and fable of peoples who are now strangers to each other. In the earlier ages, when people were more deeply imbued with this mythology, human heroes were constantly clothed in the attributes of the deities men were taught to worship, and symbolic legends gradually took their place as the great facts of national history. This period of the history of nations has been rightly described as the *mythic period*;—we can hardly consider it as history at all. The succeeding period is rather more historic, but as its records were still hardly better than minstrels' songs, is full of exaggeration and poetry, in addition to the influence which the older mythology still continued to be felt down to a much later period, and the

popular superstitions of the country not only make their appearance in a variety of incidents in civil history, but they enter still more largely into the composition of monkish miracles and saints' legends, which we owe to men who were not by any means exempt from the credulity of their less enlightened brethren, and who still shared in many articles of the creed of their forefathers, or believed that it was not a crime to turn them to their own purposes.

It arose from this circumstance, that so many of our earliest ecclesiastical buildings were built on sites which had been already hallowed in people's minds by the superstition of ages, and that by a caprice of fortune the spot has in some instances been dedicated to the service of saints, which, under other circumstances, left to the natural changes of the popular mythology which had consecrated it, has still continued even in recent times to be looked on as the haunt of fairies or hobgoblins, the latest forms of the mystic personages of the primeval creed. Even in the late fairy-mythology, these imaginary beings frequently occur in triads. They were the three goddesses of the ancient Germans, who were believed to preside over the woods and fields, to pre-arrange the fates of individuals, and to dispense the blessings of Providence to mankind. Among the remains of the later Roman period in Germany and Britain we meet with frequent altars ascribed to these three goddesses, who are generally addressed as local deities, and take their names, or rather their titles, from the locality. In a paper published in one of the volumes of our Journal, I have shown, by a number of examples, taken from different periods, how the belief in these three deities continued to exist even down to the fifteenth century, under the character of three fairies or wood-nymphs; and I now proceed to relate to you, from an event closely connected with the neighbourhood in which we are now met, how such legends as these entered into the written history of our church.

At the latter end of the seventh century, the rich valley forming the south-eastern portion of the modern county of Worcester, and bordering on Warwickshire and Gloucestershire, was covered with forest-land, which afforded subsistence for immense herds of swine, the flesh of which animals formed a very large portion of the food of our Anglo-Saxon forefathers. A part of this wood, situated on the banks of the Avon, and then known by the name of *at Homme*, was given by Athelred king of Mercia to Egwin bishop of Worcester, who was himself closely allied by blood to the Mercian kings. In the thickest part of this district was a spot inclosed by the winding of the river, thickly covered with brambles and brushwood, which probably concealed the ruins of Roman buildings—Williams of Malmesbury alludes to an old tradition that it was the ruins of a church. Time, and the superstition of the Anglo-Saxons, seem to have given a sacred character to this spot—it was probably looked upon as the haunt of the three wood-nymphs, the fairy glen of the forest.

Bishop Egwin had intrusted the keepership of this forest to four swineherds—a higher class of men than swineherds of the present day, because they had often to defend their charge by force of arms against hostile invaders. The four swineherds were two brothers, named Eoves and Ympa, and two other brothers, Trottuc and Cornuc. Each had a division of the wood under his particular care, but Eoves was the principal, and acted as commander or overseer over the rest, and his position was so respectable, that the whole wood took from him the name of Evesham, or the residence of Eoves. One day a sow, belonging to the drove under the particular charge of Eoves, which was pregnant, suddenly disappeared among the brambles where they were taken out as usual to feed. For two or three days Eoves waited patiently, in the hope that the sow would return as usual to its companions; he then became uneasy, and day after day the forest was hunted, but in vain, until a few days afterwards the wanderer suddenly made her appearance, accompanied with a litter of seven small pigs, which were all white, with the exception

of their ears and feet. Eoves was exceedingly rejoiced, for he stood high in the confidence of his master, and it appears that, in Anglo-Saxon times, the loss of one of the drove committed to his charge, however numerous, subjected their keeper to grave suspicions. Next day, however, when the swine were led out to feed, the sow disappeared again, accompanied by her young, and was the cause of new alarm. This was repeated a third time, and then Eoves, perplexed in the extreme, called together his companions, and determined to seek out, at all risks, the place of concealment. The search was laborious and painful, and Eoves was on the point of giving it up in despair, when he came to the old ruins, and discovered the object of his inquiries quietly reposing under shelter of a thick bush of brambles. Eoves probably felt some awe of the spot in which his sow had sought an asylum, and he looked warily around him, when, to his great astonishment, he beheld three damsels standing and singing, of whom the middle excelled the others in stature and in her surpassing beauty, and held a beautiful book in her hand. The swineherd was struck with terror, and he made his escape as quickly as possible, followed by the sow and her litter.

This story is simply a fairy tale, and it may be compared with numerous others, given as such by early writers, and in several of which a sow is the instrument of leading its drover to the enchanted spot. It was probably a local legend popular among the Anglo-Saxon peasantry of Worcestershire, which Bishop Egwin took hold of to turn it to a pious use. It is this prelate who has himself preserved the legend from oblivion, and we can hardly absolve him from at least a pious fraud. He declares that Eoves went and related the circumstances to the *villicus*, or ruler of the district, who took him to the bishop, and made him repeat his story in his presence. Egwin pretends that at first he disbelieved it, but that, on the earnest protestations of the swineherd, he determined to accompany him to the spot, and be himself a witness to its truth or falsehood. There, according to his own account, the bishop fell down and prayed fervently, and on rising to his feet he was blessed with the same vision that had been seen by his servant, with this difference, that the middle lady now bore a cross as well as a book, and Egwin judged at once that it was the Virgin Mary accompanied by two angels. He immediately ordered the spot to be cleared of brambles and of ruins, built in their place a stately religious house, which he endowed with lands he purchased in the neighbourhood. From the name of the wood it was called the Abbey of Evesham, and was famous in after ages under the slightly altered name of Evesham.

Such is the legend of the foundation of Evesham Abbey, as related to us by its founder; and it is the more remarkable, as it shows to us how fable often entered into history, under the very circumstances which we should imagine would have ensured truth. Bishop Egwin, either unknowingly, himself under the influence of popular superstition, or deliberately and intentionally for the sake of giving strength to his religious foundation, has handed down for historic truth what was evidently a mere fable. We are almost led to take the more unfavourable view, because, although Rome placed him among the number of the saints, other circumstances throw a certain degree of suspicion on his character. He has given his own testimony to a miracle pretended to have happened to himself, under circumstances in which he could not have laboured under a deception.

Egwin was made Bishop of Worcester about the year 692, and he had not long presided over the see before the people entrusted to his care began to bring serious charges against him. Of what nature these charges were we are not told, but they reached the ears first of the King and next of the Pope, and the Saxon prelate was obliged to undertake the then long and wearisome journey to the eternal city, to clear his character from the blot which had been cast upon it. Egwin commenced his journey with a rather ostentatious act of humility, but one by no means uncommon in these early ages. Before leaving

Mercia he ordered a smith to make him a heavy ring of iron, "such as they fixed about the feet of horses," fastened with a lock, and having locked it on his bare legs as an instrument of penance, he threw the key into the river Avon, in a place then called Hrudding Pool. Thus equipped he went to Dover, and sailed in a small vessel to Italy. On his arrival he fell on his knees on the shore of the Tiber to return thanks for his safe voyage, while his attendants fished in the river to obtain a meal. They soon caught a moderately sized salmon, and immediately prepared it for cooking; but on opening it they were struck with astonishment at finding in its belly the identical key which they had so recently seen sinking in the waters of a small river in their native and distant land.

Our only witness for this strange story is Egwin himself. He declared the truth of the miracle to the Pope, and the latter considering it as a sufficient proof of his innocence, caused him at once to be relieved from his ring, and scarcely listening to the accusations or to the defence, sent him home to Worcester with every mark of honour.

Egwin is the first Englishman known to have written his own life. His object was probably to defend himself against the attacks to which he appears to have been exposed during his lifetime. In this autobiography he gave the account of his visit to Rome, and of the subsequent foundation of Evesham, where he passed the latter years of his life; and he added to it his dreams or visions, which he pretended to receive by a sort of inspiration. This autobiography is lost in its original form; but a splendid manuscript of saints' lives, in a handwriting of the tenth century, in the British Museum, contains a long life of Egwin, perhaps considerably older than that date, which is compiled from his own book, and in which much of the autobiography, in which he speaks in the first person, is inserted verbatim. The common lives of the saints are mere abridgments of this.

This autobiography of Egwin contributed in other ways to the romantic materials of history. One of his visions, in which he speaks in the first person in figurative language, is a sort of moral allegory, in which the temptations of the world are represented under the semblance of a pagan city, against which human nature, represented in the person of Egwin, has to contend. The city is, at length, after a long struggle, overthrown by the direct interference of heaven. One of the later writers of Egwin's life, taking this literally, has transformed it into a marvellous history of the destruction of the ancient Roman town which occupied the site of the modern Alcester, in the neighbouring county of Warwick.

Thus we see, in analysing the life of one individual only, the way in which one large class of the common materials of history was manufactured. There are many other classes equally worthless, which help to form the mass, but to which I will not trespass further on your attention by alluding. Enough, I think, has been said to show you how necessary it is that what we commonly call history should be thoroughly weeded and carefully sifted before we can place any confidence in it. I may perhaps hope that this great truth will be felt more deeply by our present audience from the apt illustration it receives in a narrative so closely connected with the early annals of this ancient city.

Wednesday, August 16th.—There are a number of very fine old wooden houses in Worcester: one in Friars' Street, reported to have been the ancient Town Hall, and others of lesser size, apparently of the period of Henry VII., with some attractive specimens of porches, staircases, carvings, &c. &c. Connected with these antiquities we may notice an account by Mr. Gutch, of the Clothiers' Company of this city, read on Wednesday evening. Mr. Newton followed with an interesting *viva voce* description of the origin and progress of woollen manufacture in England, and the guilds formed to protect them.

The Rev. Mr. Rudd read a paper on a Roman inscription discovered at Kempsey, with a tracing from

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the stone, which had been split, but was afterwards joined in its original form. It was buried about four feet deep, is about three feet long, and between nineteen and twenty inches broad. It has here and there upon the surface slight excavations from decay, but none which materially interfere with the letters.

VALERIO CONSTANTINO PIO FELICI INVICTO AVGVSTO. This reminiscence of Constantine the Great appears to have existed in a Roman villa, as a flue was found among the ruins, probably pertaining to the bath.

Mr. J. G. Waller, whose diligent exploration of church antiquities has brought out so many matters of curious interest and antiquarian value, contributed a paper on Monumental Brasses, which was read by Mr. Wright. It began with excellent directions to the collector or copier of such reliques—advice very easily followed by persons unskilled in archaeology, and yet leading them to a pursuit which can add much variety and pleasure to the circumstances of tour or travel. Mr. Waller tells them that one of the first things to be done is to register in a book each brass according to its locality, accurately copying the inscription and noting the peculiarities. By this practice an acquaintance is quickly obtained of the dates and costume thereto belonging, as well as a number of other interesting particulars, which gradually arise with increasing experience and observation.

He then proceeded to a chronological view of this Monumental Art, observing that in the early brasses, of which two specimens (Sir Roger de Trumpington and The Knight from Pebmarsh) were hanging in the room, there is a conventional treatment of the features, which is seen in all the works of the time, viz., the 13th and beginning of the 14th centuries, whether in painted glass, wall painting, painting on panel, or in MS. illuminations, without exception; this peculiarity will serve at all times to indicate the period of execution. Later, during the reign of Edward III., there are many different and marked types, showing different designers, and we now meet with the florid Flemish brass, of which we possess many remarkable examples. The general distinction of a Flemish brass consists in its forming an oblong surface, composed of several plates of metal so united as to seem but one. On this surface the design is engraved, and with a richness of detail unknown to those of English art. These, however, are not the sole distinctions, for there are Flemish brasses both in England and in Bruges, in which the figures are cut out to the outline, according to the English custom. But the execution shown in the use of the graver is very different in the Flemish brass, the lines of which are generally more shallow, and all the broad ones cut by a flat chisel-shaped instrument, instead of the lozenge-formed graver; this circumstance will be found to influence the design, and make a very marked distinction between the two kinds of brasses.

In the first quarter of the 15th century, the design and execution of brasses became exceedingly elegant and graceful. Attempts were made at female beauty—the folds of the draperies were admirably disposed, and some of the animals at the feet were designed in a manner that could scarcely be surpassed. Several most beautiful designs of this era are extant in different parts of the kingdom, not so rich in details as the Flemish, but surpassing them in grace and beauty of composition. At the close of this century—a time rich in art—brasses were very inferior in every respect. It is evident their superintendence had fallen into different hands, that they were not now designed by the same class of artists, and the analogy that previously existed between them and other works of art was no longer to be seen to a similar extent. In the following century but little beauty could be found.

Portraits, continued the writer, do not appear in brasses before the 16th century; until that time every artist drew the features conventionally, in most instances of so strict a character, that the hand of the designer can immediately be traced. Attempts, however, seem to have been made—there are two examples as early as the reign of Edward II., which are by the same hand (Sir John D'Aubernon, Stoke D'Abernon, Surrey, and Sir John de Creke, Westley

Waterlen, Camb.) but which have both peculiarities which look like attempts at individuality. Sometimes eccentricities, such as the wearing a long beard contrary to the general custom of the time, are found, which I think must be regarded as something of an approach to an attempt at portraiture, but nothing beyond this was ever accomplished. In the 16th century, however, there can be no doubt upon the subject; many brasses of this time are evidently portraits—some indeed have individuality so strongly marked, that one is constrained to think them very good ones. At Bruges are some late brasses containing portraiture worthy of the hand of Rembrandt, whose heads they greatly resemble.

Brasses worked on both sides are common. When opportunity offers, by their being loose upon the slab, of making an examination, this therefore should never be omitted. To these the term *Palimpsest* has been given. An interesting example of this kind is here exhibited from Burwell, in Cambridgeshire. It is not unfrequently happens that fragments of Flemish design are found upon the *reverse*. Some instances occur where an older brass is altered to suit a later date, and another individual's memory commemorated. Two striking examples of this kind occur, one at Okeover, in Staffordshire, the other at Waterperry, near Oxford.

Of dates on brasses it is necessary to know that of themselves they form no criterion or authority for contemporary costumes or period of execution. An instance occurs of two bearing the same date whose costume and execution differ from each other by sixty years. (*Sir John de Lisle, Thrushton, Hants, and Sir John de Cobham, Cobham, Kent.*) In order, therefore, to arrive at a correct notion of the real date of the execution of the monument, a careful comparison should be instituted between as many examples of the same date, or whereabouts, as can be obtained; thus the true one will be easily confirmed, and the causes of departure from it probably determined. Blanks are often left for after-insertion of dates, and never filled up. These are very useful examples; for as it usually happens that these are put up by a survivor, it is pretty certain to be contemporary or nearly so; thus a point to start from is often obtained in settling the true chronology of dates.

On the subject of costume, brasses present great facilities for study, especially in defensive armour, where the gradual development from the ringed hauberk, &c., to an entire canopy of steel plates, may be traced in all its changes from the thirteenth to the seventeenth century, when it fell into disuse.

Inscriptions are frequently very interesting as illustrative of customs, religion, or literature, particularly when the vernacular tongue takes place of the Latin or French, which were mostly in vogue until the fifteenth century. This division of itself comprises materials for an attractive study.

For illustration of these remarks I refer, in addition to the rubbings around the room, to a collection of upwards of sixty drawings which are laid upon the table.

Mr. Fairholt followed Mr. Waller's paper with an extempore account of the series of rubbings of monumental brasses which had been communicated to the Association; and for which they were principally indebted to the Rev. G. Y. Osborne, Mr. Bridgen, and Mr. Sprague, of Colchester. He then pointed out the peculiarities of the many that were sent, and went through an entire series of rubbings from them, commenting on each, and exhibiting them one by one. He remarked on the simplicity of the early brass, consisting only of a single figure; and noticed how ornamental canopies were afterwards introduced, coats of arms emblazoned upon them in vivid enamel, and the utmost elaboration of ornament adopted. The famous Lynn brasses, he remarked, were not only very ancient examples, but were exceedingly beautiful works of art, and aided, by the curious representation of the feast of the peacock, as exhibited upon this monument, to illustrate the domestic manners of our ancestors. He pointed out the peculiarities of those large brasses which were made in Flanders, and, unlike those of England, entirely in one large

sheet of metal, the ground being covered with ornament; and remarked that they showed the connection which the merchant men of the olden times preserved between the arts and manufactures of our own country and the continent, the wealth produced by trade being often expended in the elaboration of public and private buildings connected with the great traders. He then proceeded to notice the various peculiarities of costume exhibited by these brasses, tracing the gradual introduction of plate armour in place of chain mail, descanting particularly on the ladies' costume, and pointing out the richness and elaboration of their dress, and the practice of emblazoning the surcoat or mantle with the arms, embroidered with their proper colours, upon it. He also gave a curious example of the manner in which, at a later period, the older brasses were frequently taken up from their places, turned face downwards, and then re-engraved for another person; and showed, by reversing one of these rubbings, and presenting a plain surface, how this might have been easily effected. He concluded his address by again advertising to the historic interest of these memorials, and ended by an urgent appeal for their careful preservation, mentioning a sexton who had recently consigned one of the finest in England to the melting pot.

Opening the Mummy.—On Friday, Mr. Pettigrew prefaced the opening of the mummy with one of those admirable discourses, in which he so clearly and fully explains every part of the process of embalming, and sets forth the mythology and rites of ancient Egypt connected with that remarkable practice. He then proceeded to the work in hand, assisted by his son, Dr. Pettigrew, amid the curious and almost anxious looks of the spectators of both sexes, who filled the hall.

The mummy was found to be five feet two inches in its wrappings, or about five feet in natural height; for the Egyptians were a short people, and Mr. Pettigrew had not met with a body exceeding the length of five feet five inches. The bandages unrolled, always beginning at the feet, after a few turns, disclosed a mark on the selvage of one of them. It had merely the letters M. R. M. N., a symbol of Egypt or the land, and a hieroglyphic not immediately to be recognised. The bands were of various colours, red, blue, and yellow; and some of the pieces of linen cloth skilfully woven, of superior quality, and hanging in tassels or fringes at the ends. A single grain of wheat, some leaves of the lotus flower, and a singular bit of carved work, resembling the kernel of a date, and apparently of hard wax, taken from near the shoulder, were successively found and exhibited. Another mark was also found, which seemed (as it was a little torn) to indicate simply, "the 20th year, 4th month," but whose reign, or what period, it left totally to conjecture. On arriving, through masses of wrappings, at the body, it was discovered to be that of a female; the limbs separately bandaged, and tied tightly to the frame; the hands resting on the bottom of the abdomen, and, between them, the hair of the individual, cut from her head and fastened round in the usual fashion, as seen on tombs and papyri. It was of coarse texture. The nails were painted, the eyes enamelled, the countenance good, with a well-formed nose, and rather thick lips, the head shaved, and the skull emptied of brain and membrane.

From all these appearances, Mr. Pettigrew pronounced it to be a mummy of the second class, and agreed in every instance with what he had laid down as belonging to that class in his opening observations.

His auditory hailed the conclusion with much applause; and departed highly gratified with the instruction they had received on a subject of so much interest to the inquiring mind.

FINE ARTS.

The Art Union Council have replied to the Board of Trade, through their Honorary Secretary, Mr. Godwin, expressing strongly their objections to the new and modified regulations proposed for their government. Their arguments were completely anticipated

by the remarks offered in the *Literary Gazette* on the proposal when first made (See *Literary Gazette*, No. 1640), and therefore we need only copy the conclusion of the letter now published, which is as follows:—

"The Council, without again referring to what they consider to be the limit of the powers of the Privy Council in their particular case, respectfully solicit their Lordships not, on partial information and comparatively little experience, to insist on the abandonment of an original regulation of the society, the necessity for which has become more evident year after year.

"The Council are in possession of many facts to prove still further the inexpediency of the alteration proposed, and beg leave to suggest, in the event of the Board's being still unconvinced, that a deputation of the Council should wait upon their Lordships, further to explain the grounds of objection."

FOREIGN CORRESPONDENCE.

NOTES FROM ABROAD.

Russia.—The central provinces of the empire are described as being much distressed by a threatened famine, in consequence of the lands being left uncultivated whilst ravaged by fires and cholera.

Shooting Stars.—This year, again, the shooting stars of the 10th August have been numerous. M. Gonjon, from 9h. 45m. to 11h., counted 25. Some of them were very beautiful, with a luminous train. Generally, their direction was from N. to S.; the observer was alone, looking northwards, with a little more than a third of the heavens visible to him. At the commencement of the observation the sky was clear, but towards the end became cloudy. From 12h. 30m. to 1h. 30m., he observed 70 also, chiefly passing from N. to S. M. Coulvier-Gravier, with an assistant—each embracing half of the sky, counted, from 11h. 30m. to 12h. 30m., 86 shooting stars; the total number noted by them, from 11h. 30m. to 2h. 45m., was 414. The numbers of shooting stars observed by M. Coulvier-Gravier, during the nights from 26th July to 10th August, and during the same hour, namely, from 11h. 30m. to 12h. 30m., were as follow:—26th July, 22; 27th, 15; 29th, 4 (sky grey); 30th, 25; 2nd Aug., 17; 5th, 18; 6th, 27; 7th, 30; 8th, 40; 9th, 80; 10th, 81. M. Coulvier-Gravier gives these numbers, in order to show an increase to a maximum, and then a decrease on following days. [The extraordinary labours of M. Gravier, and his tabulated observations, shewing periodical maxima and minima, formed the subject of a paper read at the Cambridge British Association, and which we reported in full.—ED. L. G.]

Hebe.—M. Yvon Villarosa observed the planet Hebe, for the first time since its re-appearance, on the night of the 10th inst. Its position, on the night of 12th to 13th of August, 1848, 12.02689 mean time, Paris, was right ascension, 4h. 54m. 6s., 51°—Declination + 8° 47' 9", 8. The planet is compared to a fine star of the 5th to 6th magnitude, w² of Orion.

BIOGRAPHY.

Sir N. Harris Nicolas, whose death we announced on the 12th, died at Boulogne on the 3rd, of congestion of the brain. The fourth son of Captain J. Harris Nicolas, R.N., he was born March 10th, 1799, and at nine years of age entered into the profession of his father, and of his elder brother, Captain J. Toupin Nicolas, C.B., recently returned from a voyage in the Pacific, which called for all the talent, skill, and management of a British officer. Under him, during the war, his boy brother served in numerous actions on the coasts of Calabria and Italy. Disappointed of preferment, or rather of active employment, he retired from the navy on the half-pay of a lieutenant, and, entering himself at the bar, became devoted to the study of genealogies and other antiquities connected with the law, and made remarkable progress in these dry and abstruse pursuits. Even before he was called to the bar by the Society of the

Inner Temple, in 1825, he had (in 1823) published the *Life of Davison, the secretary to Queen Elizabeth*, and in the following year his *Notitia Historica*, a production of valuable reference to legal and learned men. Such a life of labour as he embraced can hardly be imagined. In the same year in which he was called to the bar, he gave the world his *Catalogue of the Herald's Visitations*, and his *Synopsis of the Peerage of England*. The following year saw his *Testamenta Vetus*; and the next his *History of Rugby School and Town, History of Agincourt, with the Roll of the Men-at-Arms, &c.*, *Memoir of Augustine Vincent, Windsor Herald*, and *A Chronicle of London*. Every succeeding year he produced further amazing proofs of a diligence and research almost beyond precedent. *The Roll of Peers and Knights in the reign of Edward II.*, *The Statutes of the Order of the Guelphs*, *The Roll of Arms of the reigns of Henry III. and Edward III.*, *The Statutes of the Order of the Thistle*, *The Household Book of Elizabeth, Queen of Henry VII.*, *The Household Book of Henry VIII.*, *The Report on the De L'Isle Peacock Case*, and *The History of the Earldoms of Strathern, Monteith, and Athlone*, are so many monuments to his unceasing industry and great ability. Nor were his toils limited to works of this class. He went on to write the *Life of Chaucer*, the *Lives of Isaac Walton and Cotton*, for Mr. Pickering's edition of the *Complete Angler*; and also published an excellent edition of *Secretary Davison's Poetical Rhapsody*. There seems to be no end to our list. *The Scrope and Grosvenor Rolls*, *The Siege of Caerlaverock*, which made a strong sensation; *The Memoir of the famous Sir Kenelm Digby*, *The Autobiography of Lady Fanshawe*, *The Chronology of History*, *The Life of Sir Christopher Hatton*, *The History of the Orders of Knighthood of the British Empire*, the edition of *Lord Nelson's Life and Correspondence*, and *The History of the British Navy*, in the course of publication, are sufficient to form a library of no small dimensions. Nearly all these have been reviewed in the *Literary Gazette*, as well as other more temporary performances by the same hand. Sir Harris Nicolas' feud with the Society of Antiquaries led to some angry pamphleteering, and his more recent quarrel with the British Museum was no less marked by contumelious reproaches and accusations of misconduct. In truth, Sir Harris was no respecter of persons, and very fiery in his resentments, where he apprehended ought wrong. He was by nature a Reformer, and apt enough to find abuses in any existing institution which fell under his notice. He was honourable, and scrupulous in his endeavours to right what he supposed to be wrong, and to be himself correct in all his undertakings. It was only a few months ago that the *Life and Correspondence of Sir Hudson Lowe* were announced as having been committed to his editing, and upon this work, so interesting to one of the most memorable events in modern history, he was employed at the close of his most laborious career. He was knighted, and proud of the distinction. His features were prominent, and indicated a strong temper and much acuteness. In society, he was intellectual and full of information, especially on subjects with which his competitors were but very slightly acquainted. We lament to add, that he married young, in 1822, and has left a widow and family of eight children, to deplore his untimely loss. How many of these may be provided for we know not, but it is grievous to state that with all the labours of his brain and pen (including professional emoluments), he has been unable to leave his wife and the younger branches a sufficiency to protect them from the ills of life. The lesson is afflicting—a warning to all who would embark on the sea of literature with the hope and expectation of a recompence. It seems to be the end of all.

George Stephenson, Esq., whose death we also announced on the 12th inst., at his seat, Tapton, Derbyshire, in his 68th year, may truly be called—as he is by the correspondent to whom we owe the following sketch—

"The celebrated George Stephenson," whose name

will ever hold one of the most distinguished places in the engineering history of our country. He had been in London the week before; had quitted his son's in Gloucester Square, seemingly in health; but in the journey to Tapton on the 3d inst., experienced a chill, which on his arrival at home induced him to try the remedy of a warm-bath, followed by retirement to bed, from which unhappily he was not fated again to rise. At first the complaint assumed no very serious character; gradually febrile symptoms came on, increased perhaps by that tax upon the nervous energies which every man of distinguished mental powers must pay to those pursuits to which his attention is devoted; and it was not till about two days before his death that fatal results were apprehended.

Stephenson was a man of great and original genius in the line which nature, not education, struck out for him. Few who had ever been in his company could for a moment mistake him for an ordinary person. There was a play of thought, an ingenuity of suggestion, an originality of view in the discussion of even general topics, which evinced a mind always at work for itself, and aiming to rise above the commonplaces of ordinary observers. These were inherent in the man—the offspring of undoubted and unassisted genius. A native of the north of England, sprung from the humbler classes of life, without friends, without aid, and with little or no education, he had to do that for himself which the mass of mankind have done for them by others. By the labour of his own hands he could for some years obtain bread; and by native superiority of intellect alone was he enabled to attain distinction. It is commonly a fearful struggle from utter obscurity and poverty to eminence and wealth. This trial he endured; he overcame its difficulties by that energy and perseverance characteristic of Englishmen when a great object is in prospect. He looked back upon this struggle with satisfaction, as the triumph was wholly his own, and won no less by talents than integrity. It was interesting in a high degree to hear him detail some of his early contentions with penury and privation. No false pride interfered with the freest disclosure of the particulars of this portion of his career. Examples he knew teach more than precept; and his aim seemed to be to impress upon others the great truth that to talents, perseverance, and uprightness of character few things are impossible. He possessed another of the features of true greatness in being, even when a poor man, a generous one. It is a well-known fact in Stephenson's history, that the first ten pounds he ever possessed, which had been scraped together with no ordinary care and difficulty, was given to an acquaintance, a poor man, who in some emergency wanted it more than himself.

"Of his professional talents it is unnecessary to say anything here; they are recognised wherever social improvements are making progress. His name is inseparably identified with that which can never be disused when once established—the railroad—which adds a still higher finish to the arts of high civilization. It is not always that an original has the happiness to survive to complete his work. This, however, was Stephenson's good fortune. He has left so little for others to do in that vast addition to the resources of all nations, that no substantial variation from his plans has hitherto been carried into effect.

"In private life he earned the regard of all who appreciate worth and liberality, not less than ability. His habits were active; his constitution so vigorous, that he was tempted occasionally to take undue liberties with it, by undergoing a degree of fatigue injurious at his period of life, and which had been about three years ago productive of serious illness. His affections were warm; his manners frequently playful and vivacious, bearing that stamp of originality indicative of the man. He was fond of the society of ladies; selected them commonly for conversation in mixed parties where he could follow the bent of his inclinations; was thrice married; and leaves behind him one son, Mr. Robert Stephenson, member for Whitby, whose success and celebrity in the same profession does not fall short of that of a respected, lamented, and most affectionate father."

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VARIETIES.

The Italian Operas were both closed with great interest, and to crowded houses, on Thursday. At Her Majesty's Mills Lind appeared in *Sonnambula*; at the Royal Italian, Mme Grisi in *Lucrezia Borgia*; and, at both, the National Anthem was given, with much popular effect.

Incombustible Wood.—Payne's process for preserving wood against fire has been again put to a severe but successful test in the presence of the Lords of the Admiralty and others. Notwithstanding the extreme heat of the fire surrounding it, the prepared wood was only very partially charred, whilst the unprepared was consumed to ashes. Our readers will remember that the principle of the process is converting soluble into an insoluble salt in the pores of the timber in vacuo; as, for instance, wood prepared against "dry" is saturated with the soluble sulphate of iron, which is decomposed with muriatic acid, and the insoluble muriate of iron formed. The invention is of great value, and admits of extensive application. It has, however, been long before the public, and is doubtless generally known and employed: if not, it deserves to be.

The Ray Society.—Among the other associations whose whereabouts were made known at Swansea, we should mention the Ray Society, which, since its institution in 1844, has done good work in the field of natural history, produced some excellent publications, and according to the Report on this occasion, is flourishing as its merits entitle it to flourish. The council alone consists of nearly twenty of the most celebrated naturalists in the kingdom.

The Palaeontographical Society, embodied last year under Sir H. De la Beche, also showed a good face. Its object is the figuring and describing as complete a stratigraphical series of British Fossils as can be accomplished; and from the talents of its leading members there can be no doubt of the success of its effort.

The Cavendish Society,—president, Professor Graham,—applies itself to the promotion of chemistry and its allied sciences, and boasts of high names among the principal of its 600 members. Its first volume has been published, and others of much interest are announced; more, if the subscribers can be brought up to 900 or 1000.

Good Cause of Enmity to the British Association.—In the coffee-room of the hotel at Swansea, where we arrived at a late hour, we found a stranger in a tremendous passion with the waiter on the amount of his bill. He abused him, the house, and the Association in a wrathful style; and we could not for a while gather what the latter had to do with it. But at last he explained, that he did not belong to any

—scientific, and that he considered it excessively hard to be charged as if he were such a —— fool! "Here have I been (said he) only twenty-four hours, and I am called on to pay twenty-five shillings more than it would have cost me at any other time. It is internally hard on innocent travellers, and I wish the —— had the —— who have put me to the expense." We agreed that his was a hard case, but advised him to be consoled that he had not also the added misfortune to belong to the Association. With this he was pacified, and paid his bill.

A Swansea Opinion.—Two old ladies meeting in the street, one asked the other what was the meaning of all the unusual stir, and who were the parties that made it. "I do not know," was the reply, "but I am told there are a great many Professors among them." "Professors!" exclaimed the other; "I do hate professing!"

The following Works and Manufactories were freely opened to the inspection of the members of the British Association at Swansea.—The potteries of Messrs. Dillwyn and Co.; the copper ore yards on the banks of Swansea river; the Warlick patent fuel company (by special order); the Hafod copper works and rolling mills of Messrs. Vivian and Sons; the Middle Bank copper works and spelter rolling mills of Messrs. Grenfell; the chemical works of Messrs. James and Son; the zinc works of Messrs.

Vivian and Sons; the collieries of the Swansea coal company; the tin works of Messrs. Parsons; the Ystalyfera iron works (J. P. Budd, Esq.); the anthracite collieries of Abercraf and Cwm Twrch; the Ynyscedwin iron works of P. Moir Crane, Esq.; the Briton Ferry iron rolling mills. The grounds of Penllergare were opened to members who did not wish to go on the longer excursions between twelve and five on Saturday; and a boat, impelled by the electrical current, was at work on one of the lakes.

The College of Preceptors, within its two years and a half of embodiment, has, according to its late Report, made very satisfactory progress towards a charter and more efficient public position. But beyond this it has already performed good service for the important body, at the head of which, we trust, soon to see it legally and officially placed. Its diplomas even now carry great weight with them; and when they possess all they ought to have, supposing the functions of the council to be administered in a manner commensurate with their importance, we may expect to witness less superficiality, incompetence, and ignorance among the numerous class of teachers. In the little Republic of Monaco, as Addison informs us, in his Travels in Italy, the schoolmaster was the fifth person in the state, the only authorities before him being the two capitanos, the judge, and the physician. The result was, that the youths of Monaco were virtuously trained, and grew up to be most orderly and praiseworthy citizens of their small mountain territory.

LITERARY NOVELTIES.

LIST OF NEW BOOKS.

Abbott's *Rollo at Work*, second edition, square, cloth, 1s. 6d. Arnold's (Rev. T. K.) *Eloge Historica*, 12mo, cloth, 4s. Atkinson's (G. F.) Letters from the North, 8vo, cloth, 12s. Blair's Companion to the Altar, 12mo, roan, 1s. 6d. Bosworth's (Dr.) Origin of English and Germanic Languages, royal 8vo, 20s. Budinger's (Dr. M.) Way of Faith, 8vo, cloth, 6s. Cecil's (Rev. R.) Original Thoughts on various Passages of Scripture, 8vo, 10s. 6d. Colling's Gothic Ornaments, vol. 1, 4to, cloth, £3 13s. 6d. Day's (James) Construction of Railways, 12mo, cloth, 3s. Dobson's (Rev. W.) Selections for Composition, 12mo, series 1 to 6, 1s. 6d.; 1 to 8, 2s. Gardner's (D. P.) Manual of Chemistry, 12mo, cloth, 5s. Gill's (C.) Application of Angular Analyses, 12mo, cloth, 9s. Gray's (A.) Manual of Botany of the Northern United States, post 8vo, cloth, 14s. Guide to Northern Archaeology, edited by Earl of Ellesmere, royal 8vo, 7s. 6d. Hall's Trigonometry, fourth edition, 12mo, cloth, 7s. 6d. Hints to Sick, Lame, and Lazy, second edition, 8vo, cloth, 7s. 6d. Hutton's (M.) Trip to Pedcar and Coatham, 12mo, sewed, 1s. 6d. Letters to an Aged Mother, second edition, 12mo, cloth, 5s. Long's (Mrs. Elizabeth) Memoirs, 12mo, cloth, 5s. Moig's (C. D.) Females and their Diseases, 8vo, 18s. Pearl of Day, by a Labourer's Daughter, 3s. Pitt's (Right Hon. William) Speeches, royal 8vo, cloth, 6s. Rose's (W. A.) Yacht Voyage to Norway, Denmark, and Sweden, 2 vols, post 8vo, cloth, 21s. Stullio's (J. B.) General Principles of the Philosophy of Nature, post 8vo, cloth, 7s. 6d. Suttor's Instruction into the practice of the County Courts, post 8vo, cloth, 4s. Tatton's (Miss Elizabeth) Memoirs, by O. Winslow, 32mo, cloth, 1s. Taylor's (R. C.) Statistics of Coal, 8vo, cloth, 20s. Voitche's (Rev. W.) Greek Verbs, their Forms, Meaning, and Quantity, 12mo, cloth, 5s. Walker's Key to Walkingame's Arithmetic, by Smith, 12mo, 8s. 6d. Walker's (G. A.) on Cure of Ulcers by Fumigation, 8vo, cloth, 6s. Webster's (T.) Letters Patent for Inventions, royal 8vo, sewed, 3s. 6d. Wharton's (J. M. A.) Examples in Algebra, 12mo, cloth, 2s. 6d. Wright's (Thomas) England under the House of Hanover, 2 vols, 8vo, cloth, 32s.

DENT'S TABLE FOR THE EQUATION OF TIME.

[This table shows the time which a clock or watch should indicate when the sun is on the meridian.]

1848.	b. m. s.	1849.	b. m. s.
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ADVERTISEMENTS.

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To Professor Holloway. (Signed) CHARLES TULLY, Editor and Proprietor of the "Rosemont Journal."

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Applications for Admission must be made on or before the 22nd of September, to the Secretary, at the Society's Rooms, Suffolk-street, Pall Mall East. Subscriptions and Donations received by the Treasurer, Mr. Tennant, 1, Adam-street, Adelphi; the Secretary, at the Galleries; and to the Society's Bankers, Messrs. Ransom & Co., Pall Mall East.

Scottish Street, Pall Mall East. A. CLINT, Secretary.

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A fine Cast in Plaster, colourfully coloured, of that interesting Fossil Saurian, the Ichthyosaurus. (P. Hawking, Owen.)

The original Specimen of the unique Skeleton of this species of Plesiosaurus, now in the British Museum, was obtained from the Lias near Glastonbury, and is described and figured in the Bridgwater Treasury by Dr. Buckland (vol. ii. pl. 17).

The Cast, mounted on a strong Wood Frame, measuring 6 ft. 3 in. in length by 3 ft. 4 in. in width, is well adapted for Scientific and Provincial Museums, in exhibiting the remarkable characters and peculiarity of structure of this singular Reptile. Price of the Cast, &c. 5*s.* Sophia's Geological Models, Maps, &c., can be had of Mr. Tennant, 149, Strand, London.

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